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Steel Demands Still Piling Up

Heavy Railroad, Building, Oil, Automobile and Other Requirements Make Adequacy of Steel Supplies and Deliveries More Uncertain—Labor Shortage Holds Production More Stationary—Prices of Heavy Lines Continue To Strengthen

HEAVY demands with strong possibilities of still further increases continue to pile up in the steel market. Against this situation is the virtual inability of the works to extend production beyond the present limits. Consequently available steel supplies and deliveries become the point upon which the scale the production in many major lines of industry during the next six months, will turn. In one line, wire production, what amounts to rationing of tonnage already has been put in effect by leading mills.

Farming implement manufacturers are taking steel at Chicago on a scale which shows their production in the first half will be much heavier than recently expected. The International Harvester Co. now is operating at 80 per cent and other similar plants at 50 to 60 per cent. Fearing delivery difficulties later, western railroads are specifying in advance for rails and track accessories in a way never before equaled in that territory. Railroad equipment buying is going right ahead. Locomotive plates placed in the East this week total 15,000 tons. Seven leading automobile builders have an aggregate production schedule of 1,750,000 cars in 1923 but this is dependent upon obtaining the steel.

Labor shortages now keeping present production more stationary are reflected by the figures of steel ingot output for December which barely held their own with November. Steel ingot production in December was at the annual rate of 39,520,000 tons compared with an annual rate of 39,495,000 tons in December. Actual steel ingot output in 1922, it is indicated was approximately 33,300,000 tons.

Building On the Rise

Continuance in the spring of the great activity in building is foreshadowed by the scope of the structural steel market. December awards of this character showed a swift turn upward and were 20 per cent above November, an unusual record for the season. December lettings were 125,479 tons or 58.3 per cent of capacity against 106,315 tons and 48.4 per cent in November. New work out for bids this week includes 18,000 tons for the Equitable building, New York. Reported awards this week total 16,000 tons.

Cast iron pipe demand is the heaviest ever known for the month of January. St. Paul wants 9000 to 10,000 tons and Detroit 5000 to 6000 tons.

Oil Needs Heavier

Steel requirements from the oil companies continue to increase and the market is filled with large orders and inquiries of this character. At Chicago from 40,000 to 50,000 tons for western oil companies is pending including 15,000 to 30,000 tons for the Standard Oil Co. of Indiana, 9000 tons for the Sinclair interests, 9000 tons for the Union Oil Co. and 7500 tons for the Pan American Petroleum & Transportation Co. Tank orders placed this week total 10,000 tons.

Finished steel prices have further strengthened this week. Only the exceptional mill now is quoting 2.00c Pittsburgh on plates and 2.10c has become the minimum of various large producers. Steel bars and shapes also are working above 2.00c.

Another slight advance of the general price situation is recorded this week by the $41.13 composite of fourteen iron and steel products compiled by IRON TRADE REVIEW. One week ago the index was $41.05, two weeks ago $40.67 and three weeks ago $40.65.

An item of interest taken in connection with the buying of steel in the open market because of shortages, by various Steel corporation subsidiaries is the inquiry for 10,000 tons of billets from the American Bridge Co. for Pencoyd, Pa., delivery.

With the exception of probably 25,000 tons in small lots closed in eastern Pennsylvania, the pig iron market is quiet. More inquiry for second quarter is appearing but makers are shunning the making of prices for this period, because of uncertainty over a possible coal strike April 1. Prices continue to grow stronger.

Ruhr Outlook a Factor

Students of the international steel situation see in the French invasion of the Ruhr district, the possibility of a check on Germany's export activities and a consequent diversion of business to this country, Great Britain and Belgium. IRON TRADE REVIEW cable advices this week show that reports of interference with iron and steel plants, coal and iron mines, are greatly exaggerated.

Business Trend and Chart Section Page 219

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Steel Consumption Now Known

NO MAN, however sound a thinker, can reach valuable conclusions without a fund of information upon which to base them. Mistakes are made by sound thinkers when they do not have thorough information on a subject. In many cases, such lack of information is not due to any omission on their part. It is due more often to the fact that the information does not exist, or, in many cases, has not been assembled accurately or thoroughly. Unfortunately, in no field has there been a greater lack of really essential information than in that of distribution.

Perhaps no more important service in assembling and correlating information in a given field ever has been rendered than in the articles on steel distribution which appeared in the Jan. 5, 1922, and Jan. 4, 1923, issues of IRON TRADE REVIEW. The article of a year ago represented the first attempt ever made to group steel requirements by consuming industries and to show what percentage of the entire steel capacity should be absorbed normally by each consuming group. This year's article goes further; it shows the tonnage shipped to each important consuming group.

A couple of years ago a leading American railway executive was asked what percentage of the co steel output was taken by the railroads. He r that the railroads directly and indirectly, took 40 per cent and that it was more likely they t per cent. A little more than a year ago anoth ing railroad president stated before the . . State commerce commission that the railroads took 30 per cent. Both of these gentlemen expressed their best opinions. In fact, it then was impossible to express anything more than an opinion. Now, however, the percentage of railway consumption no longer is a matter of opinion. IRON TRADE REVIEW's figures, compiled from actual shipments by the steel plants, show that the railroads took 24.84 per cent of the steel made in 1922, which is equivalent to 17.71 per cent of the full steelmaking capacity of this country. In the same way, it no longer is necessary to form an opinion as to the consumption of the automotive, agricultural, oil, gas, water, export, machinery, food and other industries, as the tonnage each took in 1922 is given in the data compiled.

Every work must have a beginning. IRON TRADE REVIEW's articles on steel distribution a year ago opened a study which never had been attempted before, and that article contained the best representation which it was possible to make at that time of the steel requirements of the different consuming industries. This year's article carries forward the study to the extent of placing steel distribution on an actual instead of an estimated basis.

Much remains to be done along this line, however. This study is capable of further extensive development. As IRON TRADE REVIEW pursues the work of reporting actual steel requirements of consuming industries, it will expand the number of steel consuming classifications and define them. This will make it possible for the steel companies to classify their steel shipments with greater accuracy. As the subject stands now, it is on a definite basis. Consuming requirements of individual consuming industries now are a matter of knowledge instead of opinion. Steelmakers, steel consumers and the general public thereby have definite figures of incalculable value to them in forming conclusions affecting their own business.

Interchurch Report Should Be Recanted

NO feature of *The Analysis of the Interchurch World Movement Report on the Steel Strike* by Marshall Olds just published, so challenges the thoughtful attention as the incongruity of high and honorable churchmen of undeniably Christian impulses and liberality, signing and sponsoring a public declaration that is so lacking in veracity, sound logic and judicial quality as the Interchurch report, which reasonable-minded men must conclude after weighing all the evidence presented.

The author himself stresses this paradoxical situation but ascribes to these representatives of religious

ganizations no more than a negative responsibility for the preparation and acceptance of the report in the form finally presented. The only plausible answer is that which is given, namely, that those directly handling the matter in the name of the Interchurch movement, sincerely convinced of the existence of bad conditions in the steel industry had freely accepted the record of evidence as well as the testimony directed to their attention by their "technical assistants" to whom they had delegated the work of field investigation. These field investigators, as selected, unfortunately for the good name and judgment of this branch of the Interchurch undertaking, largely were composed of men of radical thought and sympathies as their public records indisputably show. The obvious result was a final report filled with condemnation of the present conduct of the steel industry and giving a strong, sympathetic voice to many forms of radical doctrine in the industrial world. Moreover, these conclusions, in many cases, as the analysis so definitely and concisely demonstrates were based upon hand-picked and manipulated quotations from authoritative records and upon deliberately falsified and distorted evidence.

There is nothing surprising or remarkable in the assumption that those zealous to do a good work and possessing no special fitness for judicial inquiry or technical knowledge of industry, as certainly was necessary, should through error, have allowed themselves to be deceived and misled by others to whom the Interchurch investigation offered an unusual opportunity for radical propaganda. That being true, as the facts show, those well-meaning individuals who were directly concerned in the creation of this report have a duty to their consciences as well as to the good name of the Interchurch movement to recant and repudiate at least, those portions of the document which it can be plainly shown were founded upon prejudice, deception and fabricated evidence.

Coke Bar To China's Iron Industry

STEELMAKERS and others who have formed an opinion from frequent reports that China offers good opportunities for the economic production of iron and steel will do well to read the article in this issue written by the United States trade commissioner stationed at Shanghai. He not only describes conditions as they actually exist, but he interprets the iron and steel situation in the Far East from the standpoint of American practice.

The most important conclusions to be drawn from the commissioner's analysis are that Chinese pig iron cannot be made under present conditions for less than $33.90 per ton. Steel rails conforming to British specifications can be made for about $71 per ton, which compares with $50, c.i.f. Shanghai, the price of imported American rails.

These excessive costs are caused by the high price of coke, amounting to $14 per ton at the stockhouse, or $18.60 per ton of pig iron. Other contributing factors are the inefficiency of the blast furnaces and open hearths, some of which are obsolete, and the lack of proper facilities in the rolling departments. The quality and quantity of iron ore is satisfactory, the supply of limestone is fair, and in the main the cost of handling these materials is not excessive. Steel scrap for the open hearth, however, is scarce, and the high proportion of pig iron charged is a disadvantage. Refractories are of poor quality, necessitating frequent interruptions to operations.

Assuming that adequate equipment were available and that it were operated at high efficiency, the high cost of coke, scarcity of scrap and low quality of refractories would seem to be limiting factors in the successful development of China's iron industry.

Coal Report Has Bright Side

WHILE the coal industry of the nation is described in the preliminary report of the federal fact-finding commission as being in a serious predicament due to overdevelopment and instability, the silver lining in the cloud is the statement that the commission has reason to believe there will be no strike on April 1. The commission expresses confidence that an agreement will be signed that will insure a continuation of peace and production for at least another year. This assurance, coupled with the fact that since the report was written, further steps have been taken by the mine operators and union officials which seem to strengthen it, is of the utmost importance to all industry. It makes the prospect for an increasing measure of prosperity much more certain.

Though labor relations in the coal fields have not as yet been analyzed thoroughly enough for the commission to present conclusions, an outstanding feature of the preliminary finding is that coal consumers are paying to maintain a surplus of 200,000 miners.

The commission is showing just how overdevelopment, long recognized as the principal evil of the industry, is causing dissatisfaction on the part of the miners and the public. It holds there can be no lasting peace until steadier employment can be provided, and that this cannot be brought about until the problem of over-development has been solved. The commission suggests a way out, in this significant paragraph: "It may be that both private property in an inexhaustible resource and labor in a public service industry must be submitted to certain modifications of their rights, receiving in return certain guarantees and privileges not accorded to purely private business or persons in private employ."

The commission has traced the fundamentals of the problem; the most interesting part of its report is yet to come, and that will be what it proposes to do to solve it.

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Nine Years Ago

January 17, 1923	January 10, 1923	December, 1922	October, 1922	January, 1922	January, 1914
$41.13	$41.05	$40.53	$43.60	$33.35	$23.03

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

SCRAP PRICES, PAGE 264, WAREHOUSE, PAGE 256, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 260

Iron and Steel Prices

Pig Iron

Bessemer, valley	$27.50
Bessemer, Pittsburgh	29.27
Basic, valley	26.00 to 27.50
Basic, Pittsburgh	27.77 to 29.77
Basic, Buffalo	28.00
Basic, del., eastern Pa.	28.00 to 29.00
Malleable, valley	27.00 to 28.00
Malleable, Pittsburgh	28.77 to 29.77
Malleable, Chicago	29.00 to 29.50
Malleable, Buffalo furnace	28.00 to 29.00
Malleable, del., eastern Pa.	29.00 to 30.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	31.13 to 32.13
No. 1X, Buffalo	29.00
No. 2 foundry, valley	27.00 to 28.00
No. 2 foundry, Pittsburgh	28.77 to 29.77
No. 2 foundry, Buffalo	27.00 to 28.00
No. 2 foundry, Chicago	29.00 to 29.50
No. 2 foundry, Granite City	30.00 to 31.00
No. 2 foundry, Ironton fur.	27.50 to 28.00
No. 2 foundry, Cleveland del	27.50 to 28.00
No. 2 foundry, del., Phila.	28.76 to 29.13
No. 2 foundry, N. J. tidewater	29.13 to 29.76
No. 2X, eastern del., Phila.	29.76 to 30.13
No. 2X, east. N. J. tidewater	30.13 to 30.76
No. 2X, eastern del., Boston	31.65 to 33.65
No. 2X foundry, Buffalo fur.	28.00 to 28.50
No. 2X, Buffalo del. Boston	30.91 to 32.91
No. 2 southern, Birmingham	23.00 to 25.00
No. 2 southern, Cincinnati	27.05 to 29.05
No. 2 southern, Chicago	29.01 to 30.01
No. 2 southern, Philadelphia	30.80 to 32.80
No. 2 southern, Cleveland	29.01 to 31.01
No. 2 southern, Boston (rail)	32.61 to 33.61
No. 2 southern, St. Louis	28.17 to 30.17
No. 2X, Virginia furnace	27.50
No. 2X, Virginia Phila.	32.67
No. 2X, Virginia Jersey City	33.04
No. 2X, Virginia Boston	33.42
Gray forge, eastern Pa.	28.50 to 29.00
Gray forge, val. del.	27.77 to 28.77
Low phos., standard, valley	35.00 to 36.00
Low phos., standard, Phila.	Nominal
Low phos., Lebanon furnace	30.00
†Low phos. British tidewater	29.00 to 30.00
Charcoal, Birmingham	32.50 to 34.00
Charcoal, Superior, Chicago	33.15

Silvery Iron
Jackson County, Ohio, furnace

8 to 9 per cent	$35.50
9 to 10 per cent	37.50
10 to 11 per cent	39.50
11 to 12 per cent	42.00
12 per cent	44.50
13 per cent	47.00

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 to 11 per cent	$44.50
11 to 12 per cent	47.80

Ferroalloys

Ferromanganese, 78 to 82 per cent domestic, f.o.b. furnace	$107.50
Ferromanganese, delivered, Pittsburgh	112.29 to 112.42
†Ferromanganese, 79 per cent, English, c.i.f. Atlantic port	107.50
Spiegel 19 to 21 per cent furnace	32.00 to 36.00
Ferrosilicon, 50 per cent contract freight allowed	82.50 to 87.50
Ferrotungsten, standard, per pound contained	90.00 to 95.00

†Duty paid.

Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, per pound contained, makers plant	13.00c to 14.00c
Imported ferrochrome, 4 to 6 per cent carbon	12.00c to 12.50c
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$8.00 to 8.25
Connellsville foundry	9.00 to 9.50
Pocahontas furnace	nominal
Pocahontas foundry	nominal
New River furnace	9.50 to 10.00
New River foundry	11.50 to 12.50
Wise county furnace	7.50 to 8.50
Wise county foundry	8.50 to 9.50
Alabama furnace	7.50 to 8.00
Alabama foundry	8.00 to 8.50

By-Product

Foundry, Newark, N. J., del.	$12.84 to 12.91
Foundry, Chicago, ovens	15.00
Foundry, Boston, delivered	16.00
Foundry, Granite City, Ill., ovens	14.00
Foundry, Alabama	8.00 to 8.50

Semifinished Material

BILLETS AND BLOOMS
(4 x 4-inch)

Open-hearth, Pittsburgh	$36.50 to 38.50
Open-hearth, Youngstown	36.50 to 38.50
Open-hearth, Philadelphia	43.17 to 45.17
Bessemer, Pittsburgh	36.50 to 38.50
Bessemer, Youngstown	36.50 to 38.50
Forging, Pittsburgh	41.50 to 47.50
Forging, Philadelphia	47.67 to 50.17

SHEET BARS

Open-hearth, Pittsburgh	$37.50 to 38.50
Open-hearth, Youngstown	37.50 to 38.50
Bessemer, Pittsburgh	37.50 to 38.50
Bessemer, Youngstown	37.50 to 38.50

SLABS

Pittsburgh	$36.50 to 38.50
Youngstown	36.50 to 38.50

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$45.00 to 47.50
Grooved skelp, Pittsburgh	2.00c to 2.10c
Universal skelp, Pittsburgh	2.00c to 2.10c
Sheared skelp, Pittsburgh	2.00c to 2.10c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.00c to 2.10c
Structural shapes, Phila.	2.325c to 2.425c
Structural shapes, New York	2.34c to 2.41c
Structural shapes, Chicago	2.20c
Tank plates, Pittsburgh	2.00c to 2.10c
Tank plates, Philadelphia	2.325c to 2.425c
Tank plates, New York	2.34c to 2.49c
Tank plates, Chicago	2.20c to 2.30c
Bars, soft steel, Pittsburgh	2.00c to 2.10c
Bars soft steel, Philadelphia	2.325c to 2.425c
Bars, soft steel, New York	2.34c to 2.44c
Bars, soft steel, Chicago	2.10c
Bars, refined iron, Pittsburgh	2.60c to 2.75c
Bars, rail steel, Chicago	2.00c
Reinforcing bars, Pittsburgh	2.00c to 2.25c
Bar iron, common, Phila.	2.325c to 2.425c
Bar iron, common, New York	2.34c to 2.44c
Bar iron, common, Chicago	2.35c to 2.50c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	2.75c to 3.00c
Hoops, Pittsburgh, small	3.00c to 3.25c
Bands, Pittsburgh	2.75c
Cotton ties, per bundle Pitts.	$1.16
Cold finished steel bars, Pittsburgh base	2.50c to 2.75c
Steel shafting	2.50c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 35.00
Relaying rails, Pittsburgh	28.00 to 32.00
Light rails, 25 to 45, mill	2.15c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.90c
Spikes, small and boat, Pitts.	3.50c
Spikes, railroad, Chicago	2.85c to 3.00c
Track bolts, Pittsburgh	3.85c to 4.00c
Track bolts, Chicago	3.85c to 4.00c
Tie plates, Pittsburgh	2.45c
Tie plates, Chicago	2.35c

Wire Products

100 lbs. to Jobbers in Carloads

Wire nails, Pittsburgh	2.70c to 2.80c
Plain wire, Pittsburgh	2.45c to 2.55c
Annealed wire, Pittsburgh	2.60c to 2.70c
Galvanized wire, Pittsburgh	2.95c to 3.05c
Barbed wire, painted, Pitts.	2.85c to 2.95c
Barbed wire, galv., Pittsburgh	3.35c to 3.45c
Polished staples, Pittsburgh	3.00c to 3.10c
Galvanized staples, Pittsburgh	3.35c to 3.45c
Coated nails, count keg, Pitts.	2.20c to 2.30c
Woven wire fencing (retailers)	68 off
Woven wire fencing (jobbers)	70½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.25c
Sheet piling base, Pittsburgh	2.00c to 2.05c
Hot rolled strip steel, Pittsburgh stamping quality	2.75c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	4.50c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.50c
No. 28, bessemer, Pittsburgh	3.35c to 3.50c
No. 28, open hearth, Phila.	3.675c to 3.825c
No. 28, open-hearth, Chicago	3.59c to 3.69c

TIN MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.50c
No. 28, open-hearth, Chicago	3.69c

GALVANIZED

No. 28, open-hearth, Pittsburgh	4.35c to 4.50c
No. 28, bessemer, Pittsburgh	4.35c to 4.50c
No. 28, open-hearth, Phila.	4.675c to 4.825c
No. 28, open-hearth, Chicago	4.64c to 4.69c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.50c to 2.75c
No. 10, bessemer, Pittsburgh	2.50 to 2.75c
No. 10, open-hearth, Phila.	2.825c to 3.075c
No. 10, open-hearth, Chicago	2.84c to 2.89c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	4.70c to 5.00c

Tin Plate

Per 100 lb. box.

Tin plate, coke base, Pitts.	$4.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	66 to 64	54½ to 53½
1 to 1½-inch, butt iron	34	19

Boiler Tubes

Carload Discount 4 Points Larger

Steel, 3¼ to 13 inches, l. c.	48 to 40 off
Charcoal iron, 3¼ to 4½ inches l. c. l.	11 off
Seamless rot rolled, 3¼ to 4-in., l. c. l.	45 off

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	$55.20 to 56.20
Six-inch and over, Chicago	51.20 to 52.20
Four-inch, New York	61.30
Six-inch and over, New York	56.30
Four-inch, Birmingham	47.50 to 48.00
Six-inch and over, Birmingham	43.00 to 43.50
Three-inch, Birmingham	56.50 to 57.00

Class A pipe is $4 higher than Class B.
Standard fittings, Birmingham, base, $110.00
6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Jan. 17, 1923	Dec. 1922	Oct. 1922	Jan. 1922
PIG IRON				
Bessemer, valley, del., Pitts.	$29.27	$30.27	$35.12	$21.51
Basic valley	26.00	25.00	30.60	18.35
*No. 2 foundry, del. Pittsburgh.	28.77	27.37	33.62	21.81
*No. 2 foundry, Chicago	29.00	28.00	31.75	19.00
Lake Superior charcoal, Chicago	33.15	35.40	36.15	31.50
Malleable valley	27.00	26.25	32.90	19.55
Malleable, Chicago	29.00	28.00	31.75	19.00
*Southern No. 2, Birmingham	23.00	22.65	27.40	16.00
*Southern Ohio, No. 2, Ironton	27.50	27.15	32.40	19.60
Basic eastern del., eastern Pa.	28.00	27.40	30.25	20.25
**No. 2X, Virginia furnace	27.50	27.75	33.00	21.75
**No. 2X, eastern del. Phila.	29.76	28.45	33.00	21.55
Gray forge val. del., Pittsburgh	27.77	27.12	33.27	21.06
Ferromanganese, del., Pittsburgh	112.29	104.91	105.47	61.90
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh	37.50	36.75	39.85	30.00
Sheet bars, open-hearth, Pittsburgh	37.50	36.75	39.85	30.00
Billets, bessemer, Pittsburgh	37.50	36.75	40.00	29.00
Billets, open-hearth, Pittsburgh	37.50	36.75	40.00	29.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.00	2.00	2.00	1.50
Steel bars, Chicago	2.10c	2.00	2.00	1.60
Steel bars, Philadelphia	2.425	2.30	2.325	1.86

	Jan. 17, 1923	Dec. 1922	Oct. 1922	Jan. 1922
FINISHED MATERIAL Continued				
Iron bars, Philadelphia	$2.325	$2.25	$2.325	$1.86
Iron bars, Chicago mills	2.35	2.35	2.50	1.60
Beams, Pittsburgh	2.00	1.95	2.00	1.50
Beams, Philadelphia	2.425	2.25	2.325	1.81
Beams, Chicago	2.20	2.10	2.10	1.63
Tank plates, Pittsburgh	2.00	1.90	2.05	1.50
Tank plates, Philadelphia	2.425	2.25	2.425	1.81
Tank plates, Chicago	2.20	2.10	2.10	1.60
Sheets, blk., No. 28, Pittsburgh	3.35	3.30	3.50	3.00
Sheets, blue anl., No. 10, Pitts.	2.50	2.50	2.60	2.25
Sheets, galv., No. 28, Pittsburgh	4.35	4.35	4.50	4.00
Wire nails, Pittsburgh	2.70	2.70	2.70	2.50
COKE—				
Connellsville furnace, ovens	8.00	6.90	10.60	2.75
Connellsville foundry, ovens	9.00	7.85	12.10	3.85
OLD MATERIAL—				
Heavy melting steel, Pittsburgh	22.00	20.00	21.35	14.50
Heavy melting steel, east. Pa.	20.00	16.70	18.00	11.75
Heavy melting steel, Chicago	19.25	17.00	18.50	11.20
No. 1 wrought, eastern Pa.	23.00	18.90	22.50	15.50
No. 1 wrought, Chicago	20.00	17.25	20.40	11.80
Rails for rolling, Chicago	20.50	18.00	20.50	12.50

*1.75 to 2.25 silicon **2.25 to 2.75 silicon

Small Sales Feature Iron Market

Philadelphia Reports 25,000 Tons Closed But Volume in Other Districts Is Not Large —More Inquiry for Second Quarter—Prices Continue To Strengthen —Embargoes Are Factor in New England

Philadelphia, Jan. 16.—An active pig iron demand made up principally of small and moderate lots but aggregating a large total has prevailed during the past week. Sales by eastern furnaces in that period have reached 25,000 tons, practically all of which was foundry iron. One consumer took 4000 tons and several others 1000 tons each and many smaller lots were closed. A good inquiry is pending including 2000 tons for the National Radiator Co., Trenton, N. J. While $29, base, eastern Pennsylvania furnace, has been quoted, the market continues at $28, base furnace, plus $1 silicon differentials. The tendency is upward, however. About 1000 tons of copper-bearing low phosphorus iron has been sold at $30, furnace. A considerable amount of such business is pending. An inquiry for 5000 tons of basic has not been placed but may be closed later. A New Jersey melter has inquired for 1000 tons of basic. Included in the large buying was a lot of gray forge and several round lots of malleable. The latter is now $28 to $28.50, furnace, and gray forge $28.50 to $29, delivered.

Embargoes Boost Spot Iron

Boston, Jan. 16.—With most New England foundries covered for their immediate pig iron needs, the outstanding feature in the present market is the serious freight situation. The New York, New Haven & Hartford railroad has embargoes at present which almost completely tie up movement of pig iron to points on that line. Permits are issued only in exceptional cases. The Boston & Albany railroad, while itself open to traffic, is suffering from embargoes of connecting lines. The resultant delays are turning attention of consumers to such stocks of iron as are in storage and to spot delivery from Boston and other ports. Buffalo iron is generally quoted at $27 to $28, furnace, or $31.91 to $32.91, delivered, and one maker report good sales at $28. Eastern Pennsylvania furnaces with but few exceptions are at $28, base furnace, or $31.65, delivered. One New York furnace with low rate to many New England points has been selling considerable iron at $28, furnace, or $30.50 to $31.50, delivered. Prices in Alabama have stiffened during the past week and at least one interest is up $1. Spot iron at Boston has been commanding a premium of $1 or more in recent buying. One sale of 200 tons of No. 2X (2.25 to 2.75 silicon) is reported at $33, delivered. A Massachusetts consumer bought 1000 tons of basic. The General Electric Co., for its Everett, Mass., works,, bought 300 tons of New York iron. A Connecticut consumer bought 500 tons of No. 2X iron at $31.41, delivered.

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Production Nearly Covered

Chicago, Jan. 16.—More activity is noted in demand for pig iron. Total sales are fairly large in many small and medium lots. Production for the first quarter is likely to be covered soon and additional furnaces probably will not be lighted, as the coke supply is insufficient. Inquiry for the second quarter is increasing but makers are avoiding the business as they expect higher costs to prevail, especially for fuel and labor. February may develop some buying for that delivery. The market is firm at $29, Chicago for the first quarter and

50 cents higher for spot delivery, though some prompt iron is being sold at $29. Foundries long idle or nearly so are resuming and are taking tonnages. The inquiry includes 200 to 300 tons of foundry iron for a Chicago user; 1000 to 1500 tons of malleable for an Indiana melter; 500 tons of foundry iron for an Illinois user, and 500 tons of malleable for a Chicago melter. Sales include 200 tons of southern iron to a Chicago user at $23, Birmingham, and another 400 tons of northern iron. An Illinois user has placed 100 tons of foundry iron. The market for silveries is more active and a sale of 400 tons to a railway equipment manufacturer is noted. Inquiry is scattered. Low phosphorus iron is in little demand. It is quoted at $35.50 to $36, delivered Chicago. Lake Superior charcoal iron is steady, on small demand.

Market Has Rest Period

Pittsburgh, Jan. 16.—Locally a noticeable lull has been encountered in pig iron although one or two apparently large sales have been closed by Buffalo interests in the Oil City district upon which Pittsburgh sellers were figuring. These include one lot of in excess of 1000 tons of No. 2X and No. 3 foundry iron to the National Transit Pump & Machine Co., Oil City, Pa. Concessions evidently were made on this business since $27.50 and $28, valley base on No. 2 grade, 1.75 to 2.25 silicon were two typical quotations which were too high. The Buffalo quotations were made sufficiently low to obtain the order notwithstanding their higher freight rate of $2.52 against $1.77 from the valley. The Oil City Supply Co., Oil City, Pa., likewise closed late last week on 4000 tons, 1000 tons going to a Buffalo interest on approximately the same basis as the previous tonnage. The remainder of 3000 tons is understood to have been placed with a western Pennsylvania steelworks furnace at $27, furnace. Other sales recently have involved relatively unimportant lots as 50 to 200 tons on which $28, base valley, has been easily secured. One or two interests consider the market firm on that basis while other authorities still believe that $27, valley, can be obtained on tonnage. Only a few inquiries have come out for second quarter including one for 2000 tons or more from a radiator manufacturer. Producers are not eager to quote that far ahead. It is understood, however, that one large merchant interest is quoting $30, valley, for delivery subsequent to April 1 but so far has closed no business. Malleable inquiries are few, the last tonnage in this territory going to the Cambria Steel Co. at $27, Johnstown, Pa., or $1 per ton under the valley. Steelmaking iron is quiet, single carloads of bessemer alone being noted on which $27.50, valley, is the ruling figure. The basic market is untested by sales but a few recent efforts to obtain quotations have developed a minimum price of $26, valley.

New Sales Are Light

New York, Jan. 16.—While pig iron buying is by no means as active as during the last two weeks in December, orders continue to be placed in fair volume. Because of their well filled order books some furnaces now are practically out of the market and an advancing tendency is noted. Most Buffalo makers are declining to quote on large tonnages, although all of them are taking moderate sized lots from their regular trade. The Buffalo minimum now is $28 furnace for 1.75 and 2.25 silicon but in some instances $29 base plus $1 silicon differentials has been quoted for prompt lots. Eastern Pennsylvania and New Jersey foundry continues to be sold at $28 base plus $1 silicon differentials. In some cases makers are asking $29 base. At least two eastern Pennsylvania makers are out of the market except for moderate sized lots for their regular trade. In view of the cost situation at least two eastern furnaces are declining to book anything beyond the first quarter. Central Pennsylvania foundry has sold at $30 base furnace, plus $1 silicon differentials. Sales of Virginia foundry continue to be made occasionally at $27 base furnace, plus 50-cent silicon differentials.

The biggest purchase of the past week was 1000 tons of malleable by the American Car & Foundry Co. The largest inquiry involves 2000 tons of foundry and an additional small tonnage of special iron for the Dunkirk plant of the American Locomotive Co.

A cargo of 6000 tons of English standard low phosphorus iron, fully guaranteed, just has been sold at $29.50 duty paid tidewater. English low phosphorus without guarantees probably still could be had at $28.50 duty paid, although the tendency is higher. Sales of a number of moderate sized tonnages of continental foundry iron have been made from $26.50 to $27 duty paid tidewater for the equivalent of domestic 2.25 to 2.75 silicon grade. Small tonnages of Lake Superior charcoal iron continue to be sold at $30 furnace. A New Jersey consumer has placed 1000 tons of basic and a Rhode Island consumer an order for a light tonnage. All this iron is to come from eastern Pennsylvania. Eastern Pennsylvania malleable is quoted at $28 furnace.

Extended statistics of European iron and steel production, American iron and steel exports and imports, page 262

Some Large Buying

Cincinnati, Jan. 16.—Pig iron distributors' opinions vary to some extent as to existing market conditions. Some say the market is easing off, while others contend it is growing firmer. Despite this difference several fairly large orders were placed here during the past week. The Indianapolis Casting Co. took 500 tons of northern iron and the Interstate Car Co., 300 tons of northern iron. A northern Indiana consumer placed 500 tons of northern. These represent the largest sales, but coupled with this was an accumulation of small orders ranging from 50 to 150 tons. New inquiries are not as plentiful as a week or so ago, and they involve no large amounts. A Newark, O., stove maker is in the market for 200 tons of southern for February shipment. Prices have undergone no radical changes. While $23 Birmingham can still be done on the base grade, the higher silicons are commanding prices above the regular 50 cent differentials. While furnaces as a rule have not opened their books for second quarter, there is some inquiry for that position developing. Northern iron is being sold at prices ranging from $27.50 to $28, Ironton, while the southern quotations range from $23 to $25, Birmingham.

Selling Into Second Quarter

Birmingham, Ala., Jan. 16.—Sales of pig iron for second quarter delivery are becoming more numerous and there are prospects for a good buying movement in the near future. Prices are showing more strength and sales are reported at $25 for No. 2 foundry. The minimum is $24, though consumers still are seeking $23. Production is being well maintained. The melt in this district continues to increase, and some of the large consumers are asking for steady delivery. Sales during the past week called for lots as high as 2500 tons, while several 500 tons were disposed of. Three furnace interests continue out of the market for first quarter iron, and two companies are refusing to book orders for the second quarter, except for regular customers. Users in the Chicago, St. Louis and Cincinnati territories continue to inquire for iron. The next blast furnace scheduled to resume operation is that of the Alabama Co. at Gadsden, which will be blown in before Feb. 1. Two other furnaces are out temporarily for repairs.

First Quarter Tonnage Scarce

Buffalo, Jan. 16.—Pig iron for the balance of the quarter is scarce and the price is strong at $27 to $28, with $28 the ruling price the latter part of last week and the fore part of this. The differential is 50 cents and $1. The malleable price is $28.50 to $29. Inquiry amounts to about 10,000 tons with selling in about the same tonnage. One furnace interest has retired from the first quarter market and from the reports of heavy backlogs, it seems probable that makers will soon open their second quarter books.

More Interest in Second Quarter

Cleveland, Jan. 16.—Little business is being transacted at present in the market for pig iron, though more interest is shown by buyers in the second quarter. One maker has received inquiries in the week for around 5000 tons of foundry grades for that period, including several 1000-ton lots and one close to 2000 tons, these coming from Indiana and Michigan points. A moderate tonnage of iron could be sold for that delivery at this time, but practically all furnace interests refuse to quote. A Cleveland interest which is naming $27, furnace, for outside delivery, and $27.50, furnace, for shipment in Cleveland is offering these prices for second quarter. The price of $27, furnace, was done in the week on 1000 tons of No. 2 foundry for ship-

ment to Indianapolis in the second quarter. An Ironton furnace quoted $27.50 on this business, provided shipment could be made in the first quarter. Other lake furnaces refused to quote for the second. The same interest has booked some small tonnages for prompt delivery in Cleveland at $27.50, furnace. In some directions the market continues to show firmness, while in others there is no inclination at present to advance. On some fair tonnages taken in the week a price of $28.50, Toledo furnace, was named. Some small sales have been made on a basis of $29, Detroit, an advance of 50 cents in the week. A large merchant interest continues to name $28, furnace, for shipment from Buffalo and valley furnaces, and has taken some small tonnages for shipment from the latter, though it is reported here that iron can still be had at $27.50, valley furnace. The price named by western Pennsylvania furnaces represented in the northern Ohio group continues $27 to $28. The largest collective group of sales reported by any one interest here is 5000 tons in the week, principally to consumers west of Cleveland. Makers report shipments are better.

A lot of 500 tons of No. 2 southern iron was sold in the week for delivery in the Cleveland district, first quarter, at $23.50, Birmingham base.

Market Shows Strength

St. Louis, Jan. 15.—The market for pig iron shows considerable strength, and melters are proceeding to fill their requirements. The melt since the first of January has increased perceptibly, and several important interests which have allowed their reserves to fall unusually low are in urgent need of iron. Most of the furnaces are sold up for first quarter, and are making no particular effort to take additional tonnages. The largest single transaction reported during the week was 10,000 tons of basic sold to an east side melter for the first half. This order went to the St. Louis Coke & Chemical Co., which reports additional sales aggregating about 1000 tons in carloads up to 150 tons. An Illinois car builder purchased 2000 tons, 1000 of foundry and 1000 of car wheel iron. A stove manufacturer took 300 tons of foundry, and another specialty maker, 250 tons for first quarter. There is an excellent inquiry for special grades for mixing purposes. A sale of 300 tons of imported low-phosphorus iron was reported, and 100 tons of ferrosilicon. The demand for charcoal iron is more active. Selling agencies report their customers are requesting prompt shipment on contracts. With the exception of stovemakers, all interests are busy, and have business booked to engage their capacity for several months. One leading steel interest reports business on hand sufficient to maintain its present rate of activity until next October. Quotations on southern iron range from $23 to $25, most sales reported being at $24. Northern iron is quoted $29 to $30, a small tonnage on Saturday having been taken at $30. The leading local producer is asking $31.50 to $31.50, f.o.b. Granite City. There is a scarcity of high silicon iron, with several furnaces asking a premium of $1 per ton on all analyses over 2.75 per cent.

Coke Market Recovers

Slump in Demand Quickly Followed by Renewed Buying, with Restoration of High Price Levels—Furnace Fuel $8 to $8.25

COKE PRICES, PAGE 198

Pittsburgh, Jan. 16.—During the latter part of last week a slump in demand for beehive heating coke was noted, accompanied by a similar falling off in requests for prices on furnace coke. This week, however, there is an improvement in respect to both grades, and demand again appears to be absorbing production. After falling off to $7.75 on standard blast furnace fuel, the market quotation now is $8, with $7.75 available to jobbers in one or two sources. Jobbers this week have paid $8 for heating coke, and up to $8.25 is being quoted on heating and standard 48-hour fuel. Two or three blast furnace interests have negotiated for 2000 to 3000 tons monthly for the first quarter or for the last two months of that period. One or two have closed at $8 for filling in purposes. So far no definite inquiries are out for the second quarter. One blast furnace interest closed last week on 40 carloads to help out its tonnage coming in on contract, and paid $8 per ton. The market, therefore, can be quoted at $8 to $8.25, ovens. Considerable heating coke and furnace coke for heating purposes is understood to be on railroad sidings in the East, as well as in the coke regions. In the latter, the coke is said to be held up by embargoes. The demand for foundry coke is fair, with inquiries calling for one to five carloads. Machine-drawn foundry coke has been sold to jobbers at $8.75, for which they have obtained a minimum of $9. This figure is the minimum now quoted on hand-drawn standard selected 72-hour fuel, $9.50 being the highest quotation noted here this week. Car shortages still exist, although this is more marked in connection with coal than with coke. Production, according to the *Connellsville Courier*, for the week ended Jan. 6 was 217,850 tons as compared with 192,410 tons the preceding week.

Canadians Buying Coke

Detroit, Jan. 16.—Manufacturers of by-product coke in this district report an unusual demand for domestic and furnace grades from Canadian sources. The volume of business done thus far this season is large; price is unchanged at $14, Detroit ovens. Dealers have had competition from outside coke.

All Grades in Demand

Cincinnati, O., Jan. 16.—The local coke market is featured by a brisk demand for all grades and sizes. An exceedingly large volume of business was closed during the past week in small orders. A number of the dealers are receiving inquiries for sizes that will not be available until after Feb. 10, in view of the fact that the ovens are sold up until that period. A large percentage of the present business is for immediate delivery and this is somewhat of a hardship to the trade because of inadequate stocks. Demand for beehive coke for domestic purposes is the outstanding feature. Prices are holding firm as a rule, although the Wise county furnace grade is selling from $7.50 to $8.50. Shipments of coke from the Wise county field into this district, which for some time required four days, are now arriving in two days. The Indianapolis by-product coke market is firm at $14.90, delivered, for the foundry grade.

Eastern Buying Fairly Heavy

New York, Jan. 16.—Fairly heavy buying has featured the foundry coke market during the past week. This was to a considerable extent due to the fact that considerable coke recently produced has not been of sufficient high grade to ship on contracts, and consumers had to buy elsewhere to fill in. New inquiry is smaller. Prices during the week were as low as $9, Connellsville, for beehive foundry coke, but the minimum now is $9.50 and a good proportion of the business is bringing $10. Demand for coke for domestic heating purposes is responsible for the great market strength. Furnace coke is bringing $8.50 to $8.75, Connellsville, for heating purposes. The Seaboard By-Product Coke Co. continues to quote $12.84 to $12.91, delivered at Newark and other northern New Jersey points, for by-product foundry coke.

Strong Market at St. Louis

St. Louis, Jan. 15.—Coke continues to maintain a strong position, with the demand active, offerings light and reserve stock at low ebb. Eastern operators are assuming an independent attitude, and intimate to western consumers that their unwillingness to serve is due to the fact that the long hauls would affect the already demoralized car supply. Local by-product ovens have been able thus far to supply melters in the district, and with improved receipts of coal these interests expect to be in a better position by the end of the month. Little coke is coming from Connellsville and other eastern producing centers. Prices for eastern coke have advanced about $3 from the recent low point, and minor sales are reported at $10. A fair amount of southern coke is arriving, and Alabama ovens are offering tonnages freely here and to the West. The leading east side by-product producer continues to quote $14 for foundry coke.

Demand Good in South

Birmingham, Ala., Jan. 15.—Coke demand is steady and prices are holding firm. Production continues at the same rate noted for several weeks. Two of the large by-product plants in this district are supplying coke for the makers' needs, a third plant has some surplus for the open market, while two independent by-product plants are selling in the market. Another small by-product plant is furnishing the company's own needs. Beehive ovens in operation are producing well and demand is good. Pitch coke is in demand.

Bar Books Are Filled Up

Producers Forced To Turn Away Considerable Tonnage—Inquiry Is Broad and Insistent—Implement Manufacturers in Market for Large Tonnage

BAR PRICES, PAGE 198

Chicago, Jan. 16.—The inventory season has been no deterrent to inquiry or buying of soft steel bars or of any form of finished steel. Up to the middle of January an important maker at Chicago has booked double the tonnage taken during a similar period of December. Inquiry is the most insistent and broadest experienced in the past 12 months. It has been necessary to turn down important tonnages on which delivery requirements could not be met. Prices are stiffening, which indicates that all producers have filled their books for several weeks in advance. Agricultural implement manufacturers are becoming more active and are getting more encouragement in the attitude of farmers, who are buying more broadly than had been expected. International Harvester Co. now is operating its plants at about 80 per cent of capacity. This is bringing considerable demand for soft steel bars to western mills. Automobile builders are finding difficulty in obtaining sufficient steel to meet their heavy programs and are using every effort to have full tonnage shipped them. Plans for production of 1,750,000 automobiles by seven important producers have been made and depend largely on steel shipments. Some eastern producers find themselves sold up and have withdrawn from this market for first quarter deliveries. One of these who has been selling at 2.00c for first quarter is now quoting 2.10c and will not take on any second quarter tonnage.

Demand for bar iron is sufficient to keep mills operating at single turn with prices steady at 2.35c to 2.50c, the minimum applying on most business.

Bookings of rail steel bars are being made in small lots, but mills have comparatively little backlog. This material is quoted at 2.00c, mill.

Good Demand Rules

Pittsburgh, Jan. 16.—Good demand has ruled for the past two weeks in connection with merchant steel bars. In several instances makers are filled up for the entire first quarter. Deliveries now are promised three months hence but several makers are not making definite promises. The orders and inquiries involve lots of from 50 to 2000 tons at a time. Prices appear stronger and 2.00c, base Pittsburgh, now is the firm going market with unmistakable signs of still higher levels prevailing before long. In fact, already 2.10c, base Pittsburgh, has appeared. In a few instances this price has been obtained on limited tonnages and in connection with one sale of several hundred tons, 2.10c, f.o.b. Youngstown mill, applied for delivery to a West Virginia point. The Carnegie Steel Co. is well filled up with business for weeks to come and some of its bar customers are looking elsewhere for more prompt deliveries.

Improvement has extended to refined iron. Individual orders are more numerous and are increasing in size. While 2.60c, base Pittsburgh, is the regular price, as high as 2.75c has been paid on small sizes and tonnages. On double refined iron, in which no scrap is used in the mixture, 4.50c is the going quotation. Several 100-ton lots have been placed recently by various consuming lines.

Heavy Business Booked

New York, Jan. 16.—In view of the fact Pittsburgh and middlewestern bar makers are sold up for months ahead, eastern bar mills are booking a heavy business. It now is difficult to get bars for prompt shipment and in some instances prompt carloads have been sold at 2.10c base Pittsburgh. Nothing under 2.00c has been done for some time and there is an active movement to place tonnage at this figure. A large part of the tonnage now being placed at 2.00c is coming from buyers who recently declined to place orders at 1.95c, Pittsburgh.

Turn Away Tonnage

Cleveland, Jan. 16.—Makers of steel bars report that they are obliged to turn away considerable tonnage for delivery during the next three months or so because of uncertainty whether they can make deliveries in their present filled-up condition. A fair amount of new business continues to be offered from time to time although manufacturing consumers are well covered on their requirements. Some favorable reports continue to come from the agricultural implement industry and inquiries from that source indicate that operations for the first half will be on a much higher basis than previously expected. Prices on steel bars are very firm at 2.00c, Pittsburgh minimum and a range up to 2.10c now is quotable. Hoops show more strength, the small widths being held at 3.00c, Pittsburgh, or higher and up to 3.80c is reported to have been done in one case. Larger widths are 2.75c to 3.00c. Bands are unchanged at 2.75c to 3.00c.

Mill Capacity Taxed

Buffalo, Jan. 16.—Steel bar mill capacity is being taxed to the limit to take care of the business offering. Mills are particular what they accept and the market is strong at 2.00c Pittsburgh. Two mills have instructed their sales offices to retire from the market on first quarter business. Second quarter business is not being considered yet.

Deliveries Are Extended

Philadelphia, Jan. 16.—Steel bar demand is heavy. Independent producers now are unable to promise delivery on contracts under two to three months, while the Steel corporation deliveries extend from five to six months. All mills now are quoting bars at 2.10c, base Pittsburgh. The railroads have been the chief buyers of late.

Sales Further Improve

Boston, Jan. 16.—Bar sales which a week ago showed an unusual improvement over the previous week's sales have shown an even greater improvement during the past week and the total placed was probably in excess of 7000 tons. Consumers apparently are becoming anxious to cover at the present price level, and are ordering early in order to insure delivery.

Cold-Drawn Sales Heavy

Pittsburgh, Jan. 16.—Conditions in the cold-drawn steel bar trade are excellent except insofar as the price is concerned. It is claimed 2.50c, base Pittsburgh, does not leave sufficient margin for the conversion of merchant steel bars which are being sold at 2.00c to 2.10c, base Pittsburgh. Owing to the heavy bookings in the past two or three weeks, plants are booked for several weeks to come to capacity. Specifications calling for approximately 200 to 400 tons of a size have been fairly numerous of late.

Bolts and Nuts in Fair Demand; Rivets Weak

NUT AND BOLT RICES, PAGE 260

Chicago, Jan. 16.—Prices for bolts and nuts are firm at the schedule of discounts which has been in effect several weeks, all tendency to shading these prices having disappeared. Most producers have sold their entire production for first quarter, with the exception of an occasional small tonnage which can be taken on for spot delivery. Some users who failed to make contracts during December for their first quarter requirements find themselves unable to cover with western makers.

Railroads Ordering Nuts, Bolts

Pittsburgh, Jan. 16.—A recent development in the nut and bolt market is the increased number of orders and specifications from railroads for other than track bolts. One interest report the receipt of an order for 15 carloads from one railroad within the past few days. This character of buying appears to be opening up since several other inquiries are pending. Other large users too, are engaged in placing business and jobbers are active in collecting stocks. This likewise applies to rivets. While the quoted prices are unchanged they are stronger.

Expect Heavy Demand

Boston, Jan. 16.—Orders aggregating over 500 tons of bolts and nuts were placed during the past week and the demand in this market is reported as exceptionally heavy. Inquiry points to further heavy sales. The price is firm.

Bolt and Nut Prices Firmer

Cleveland, Jan. 16.—Prices for bolts and nuts are considerably stronger at present than was the case the latter part of December. At that time a good spot tonnage could be placed at quotations from 5 to 10 points below the quoted market. However, such is not the case today and if anything the tendency is in the other direction. Good specifications against contracts are being received as well as considerable spot business.

Little change is noted in rivets as compared with last week. Demand is fair and prices show the same softness. A fair amount of business is

being received from consumers of all kinds and on the whole demand is satisfactory.

Demand Is More Active

Philadelphia, Jan. 16.—Bolt and nut demand is more active. Good orders are being placed and are coming from miscellaneous sources, especially from the railroads. Rivets which were in dull demand, have improved greatly, and good specifications are being received. Prices for bolts and nuts are firm while quoted prices on rivets in some instances have been shaded as much as 10 points.

Hoop Demand Is Reviving

HOOP PRICES, PAGE 198

Pittsburgh, Jan. 16.—The hoop and band market again is showing signs of life after lying more or less dormant for several weeks. Orders and specifications on contracts are increasing, involving from 50 to 1000 tons at a time. A few of the latter size have been taken for shipment over the quarter while one or two involving 500 to 1000 tons have been booked for delivery during January. The market is fairly firm at 2.75c although on certain small lots as high as 2.90c still is obtainable.

Chain Advanced $5

Pittsburgh, Jan. 16.—Late last week prominent steel chain manufacturers, including the United States Chain & Forging Co., announced an advance of 25 cents per 100 pounds, or $5 per ton, on proof BB and 3-B coil chain, also on wagon chain, effective Jan. 15. This increases the base on 1-inch proof coil chain from $6 to $6.25, f.o.b. Pittsburgh base.

Spar Market Firm

Pittsburgh, Jan. 16.—Users who failed to cover for all the fluorspar they need report the market is fairly firm at $21.50, f.o.b. Kentucky or Illinois mines. The only concession under that level is where an individual or company has some spar for sale which it is anxious to move because of lack of storage space or for some other reason, and then the concession only is around 50 cents per ton. A West Virginia steelmaker recently closed on two carloads, about 100 tons, at the approximate market price. One or two similar sized inquiries now are current from other directions.

Blows In Furnace

The Cranberry Furnace Co. on Jan. 9 lighted its blast furnace at Johnson City, Tenn. The stack, which was remodeled during the past year, is producing copper-free, low-phosphorus iron and is in operation for the first time since the reconstruction work was completed.

The Hendee Mfg. Co., Springfield, Mass., has purchased the property of the Harley Co., East Springfield, Mass., brass founder and drop forger, a subsidiary. The purchaser held a $625,000 mortgage on the property and bid it in at auction.

Tank Plate Buying Brisk

New Inquiry at Chicago Calls for 40,000 Tons—Demand for Oil Equipment Widespread—Prices Stronger—Eastern Mills Filling Up

PLATE PRICES, PAGE 198

New York, Jan. 16.—In addition to the oil storage tanks for Cushing and Harmony, Okla., which were reported in last week's IRON TRADE REVIEW as having been placed by the Sinclair Crude Oil Purchasing Co., the Sinclair interests now are negotiating for thirty 80,000-barrel tanks additional, involving 9000 tons of steel. Incidentally, the order reported last week for 11 tanks as having gone to the Chicago Bridge & Iron Works, will include 11 to 15 tanks, the final number not yet having been determined. The Boiler & Equipment Supply Co., 2 Rector street, New York, is in the market for 190 welded tanks, 9 feet in diameter, 45 feet long, of 1½-inch plates for 250 pounds pressure. There is a brisk volume of spot buying. Prices have firmed to the extent that 2.00c, base Pittsburgh, now is not being shaded and there is some talk of advancing.

Award of 1500 tons of tanks for the Prudential Oil Co., Baltimore, has been made to Curtis Bay Co., and 100 tons of tanks for the Vacuum Oil Co. to the Hammond Iron Works.

Heavy Inquiry for Tank Work

Chicago, Jan. 16.—Inquiry for oil tanks and refinery equipment now in the market calls for a total of about 40,000 tons of steel, the larger part of which is plates. The Standard Oil Co. of Indiana is inquiring for 15,000 to 30,000 tons of steel. The Sinclair Oil Co. has taken bids on general equipment and tanks for its refinery at Houston, Tex., which includes 12 55,000-barrel storage tanks, the entire project involving 7500 tons of steel. The inquiry of the Union Oil Co. for 9000 tons of steel continues unfilled. The Pan-American Petroleum & Transportation Co. is in the market for about 7500 tons of steel. Chicago mills are practically sold for first quarter and certainly will not be able to handle as heavy a tonnage as these inquiries require. The leading interest is quoting 2.20c, Chicago mill, for plates, while the quotation by Inland Steel Co. is 2.30c, Chicago.

Market Trend Is Upward

Pittsburgh, Jan. 16.—Prices on plates are trending upward now that shops are filling up with business. Leading steel interests have commenced to name 2.10c, although 2.00c, base Pittsburgh, still is obtainable in a few directions. The Phoenix Iron Works, Meadville, Pa., recently endeavored to place several thousand tons at lower than 2.00c but is reported to have been unsuccessful. Carnegie Steel Co. is unable to offer desirable deliveries, hence a few of its customers are endeavoring to place business elsewhere. The Cambria Steel Co. has plate work for three months ahead. The Pittsburgh-Des Moines Steel Co. received orders for two 55,000-barrel tanks from its Dallas, Tex., office involving about 380 tons of plates and shapes. The Independent Bridge Co. recently received four barges from the National Contracting Co. for use on the Ohio river, involving about 400 tons.

Prices Working Higher

Cleveland, Jan. 16.—Plates have lost their recent reputation of being the weakest heavy product and now are uniformly held on a higher basis. The lowest going price is 2.00c, Pittsburgh, and this is confined to only one or two makers. Other large mills are naming 2.10c and smaller producers, up to 2.25c. Considerable small lot business is being placed at the latter figure for early delivery. An eastern maker has booked some good sized orders for two to three weeks delivery at 2.15c to 2.25c, Pittsburgh. Considerable oil field tank work continues to come before the market. The Reeves Bros. Co., Alliance, O., have taken 26 tanks for the Standard Oil Co. of Ohio at Toledo requiring 1100 tons. For marine work an inquiry of 700 tons of plates and 450 tons of shapes for the rebuilding of two boats for the Great Lakes Steamship Co. has come up. Mills also were asked to quote this week on 3200 tons of steel for another freight vessel upon which lake yards are figuring. The Paino Construction Co., Brooklyn, has received the general contract for a large riveted pipe line for that city requiring 3000 tons.

Eastern Mills Pick Business

Philadelphia, Jan. 16.—So rapidly is pate business accumulating that eastern makers now are choosing their business. Inquiries are coming from all sections, a large part of it from the West which apparently is due to the inability of mills in that section to make early deliveries. Eastern demand, however, is improving greatly. Numerous consumers of plates placed first quarter contracts and some are requesting to be covered for second quarter but the mills refuse to quote for that position. All makers have advanced and their minimum price on new business now is 2.10c, Pittsburgh. Lower prices are being withdrawn as fast as possible. Two mills now are quoting 2.15c, base, Pittsburgh. The leading producer quoted 2.10c, Pittsburgh, on business the past week and 2.00c appears the lowest of any business just closed. The Baldwin Locomotive Works has placed 4000 to 5000 tons of accumulated business with several eastern mills. The Pennsylvania railroad this week will close on 3000 tons of plates. The Reading railroad has bought 3000 tons of locomotive plates. Most of the business has consisted of small and moderate lots. The Newport News Shipbuilding & Dry Dock Co. has received a contract for four government dredges involving 325 tons of steel each. The Pennsylvania railroad shortly will take bids for car floats and the Eastern Steamship Co. is expected to act next week for the award of one or two vessels. Eastern mills are bidding on 5000 to 10,000 tons of plates for Pacific coast delivery.

Scrap Buying Is Limited

Consumers Are Anxious for Large Tonnages but Await Lower Prices Before Closing—Higher Quotations Are Coming Out

SCRAP PRICES, PAGE 264

Chicago, Jan. 16.—Iron and steel scrap continues on a double level of prices, the higher being the figures paid by dealers for material they buy from railroads and other producers, while consumers refuse to pay such high figures and for the most part are out of the market. This condition is especially true in steel grades. Cast grades are strong and in most demand, the matter of price not being held so important by users. There is also considerable demand for specialties, especially those furnished by railroads and on small offerings the present supply is taken readily. Railroad offerings are not excessive and dealers are paying excellent prices for the material. The Wabash railroad offers 2800 tons, the Northern Pacific railroad 3500 tons and the Monon railroad 600 tons.

Prices Are Advanced

New York, Jan. 16.—Following spirited bidding among dealers and brokers, prices for iron and steel scrap have advanced with the upward movement affecting all but a few grades. While a good portion of the material now being purchased is to meet increasing demands at consumers' plants much is being bought on speculation, as the outlook for heavy buying at the mills for the next few weeks is regarded as most promising. Already demand in the East has improved to such an extent, with bids by the mills steadily being advanced, that selling for shipment into the Pittsburgh district has fallen off sharply. One dealer now is paying $19.50, delivered, for No. 1 railroad steel for Bethlehem, Pa., and many other instances of higher prices on material for shipment in the East is noted. Among items recently advanced, the increases ranging anywhere from 50 cents to $1.50, are heavy melting steel, No. 1 railroad steel, wrought pipe, railroad wrought, borings, turnings and mixed borings and turnings, and heavy cast scrap.

Heavy Demand Prevails

Buffalo, Jan. 16.—Shipments are slowing up in the face of the strongest demand for scrap in the past two years. With a brisk market prevailing for every grade, embargoes have come out on every railroad entering Buffalo. Mills are scrambling for cars and bad weather conditions are helping to clog transportation. Local consumers have purchased 25,000 tons of heavy melting steel in the past week; the price has jumped to $21 to $21.75. Authenticated sales have been made at the lower figure and reports are that $21.75 has been paid. Dealers are holding back the major portion of their stocks for higher prices. Meanwhile Buffalo steel has sold for $23 Youngstown. Mills are eagerly seeking material and prices have risen all along the line.

No Insistent Demand Noted

Pittsburgh, Jan. 16.—At present no insistent demand is noted for scrap and buyers apparently are holding off. While as high as $23 has been paid for several thousand tons of heavy melting steel by a Steubenville, O., district user, this is understood to have comprised only No. 1 railroad and first class industrial scrap, which always commands a premium. It is doubted if above $22 can be obtained for regular heavy melting steel today although up to $22.50 is quoted. Some nearby consumers have paid $24.50 and $25 for fair sized lots of steel specialties during the past week or 10 days although today it is difficult to obtain higher than $24. A Brackenridge, Pa., consumer is offering $17 for machine shop turnings but up to $17.25 was quoted in the open market. This interest only will pay $20 for heavy breakable cast against the market spread of $20 to $20.50. For cupola cast, as high as $24 recently was paid although no one is willing to pay that price today. Sale of the cast grades generally is limited right now although various lots up to 1000 tons at a time of the different steel grades are noted.

Filling Immediate Needs

Cleveland, Jan. 16.—Consumers are buying but little, if any, iron and

(*Concluded on Page* 217)

Semifinished Booked Up

Scarcity of Available Sheet Bars, Slabs and Billets More Pronounced—Some Mills Out of Market—Price Trend Is Upward

SEMIFINISHED STEEL PRICES, PAGE 198

Youngstown, O., Jan. 16.—Only one producer in this district has semifinished material available for first quarter delivery. Approximately 3000 tons of sheet bars for February shipment were placed late last week at $38.50, Youngstown. A shortage of steel at one maker's plant will not permit the acceptance of additional sheet bar business, and this maker is out of the market for the remainder of the quarter. Expanded operations at the plant of the third semifinished producer has created a situation of a similar character and while this maker's price of $36.50, Youngstown, has not been changed it is impossible at the moment to contract for tonnage.

Seeks 10,000 Tons of Billets

Philadelphia, Jan 16.—Heavy business is current in semifinished material. The leading development is an inquiry from the American Bridge Co. for 10,000 tons of rerolling billets for Pencoyd, Pa. The mills at Pencoyd for some time have been receiving inadequate shipments of raw materials from the usual Pittsburgh sources. This company which seldom enters the new material market has just bought 5000 tons of basic pig iron and now wants billets. New sales of billets in this district total 10,000 tons of which 6500 to 7000 tons were rerolling and the remainder forging grade. This business went at $36 and $38.50, Pittsburgh, for rerolling and $42.50 and $43 00 for forging. The minimum on forging now is $43.00. Several inquiries for semifinished material are pending, the largest being 4000 tons of sheet bars for the N. & G. Taylor Co., Cumberland, Md.

Market Is Firmer

Pittsburgh, Jan. 16.—Most steelmakers need in their own mills all the semifinished material which is left after provision has been made for contracts booked some time ago. Except in one or two cases, advantage cannot be taken of the several inquiries that are pending for sheet bars, billets and slabs. In some directions a real shortage is encountered. One local independent steel company is said to have some material available, mainly billets. A few inquiries for billets received by one or two producers here involve 1000 or 2000 tons and a few sales of that size recently have been made at as high as $38.50, Pittsburgh. One inquiry for sheet bars calls for 2000 tons and it is doubted if a quotation below $38.50, Pittsburgh can be obtained, even on the quantity of material. While the market spread still remains $36.50 to $38.50 on all three products, the minimum is entirely nominal. It has entirely disappeared as a quotation in the open market. Buyers recently closing at $38.50 made a thorough canvass of the situation before placing their business.

Only a small inquiry now and then develops for forging billets. On these, up to $47.50, Pittsburgh, is quoted although the usual price would be $5 above the market for rerolling billets, or $41.50 to $43.50.

One sale of 2000 tons of skelp is noted on the plate basis, 2.00c to 2.10c, base Pittsburgh. Up to 2.25c, however, is quoted on certain grades of skelp.

Billet Tonnage Asked

Cleveland, Jan. 16.—An inquiry of 2000 tons of 2½-inch forging billets for first quarter delivery has been put out by a local manufacturer. Some of the mills have been unwilling to quote upon this business. No further sales of sheet bars are reported. Although a western Pennsylvania maker is reported still to be naming $36.50, mill, on sheet bars, it is doubtful whether any tonnage could be placed in this and the valley district under $38.50. Sales of a few hundred tons of wire rods in this district at $47.50, Pittsburgh, are reported.

Warehouse Demand Still Is Heavy; Prices Firm

WAREHOUSE PRICES, PAGE 256

New York, Jan. 16.—Quotations in the local warehouse market are unchanged, but with mill prices again

moving upward on some products, notably shapes, it appears likely some revisions upward will be made soon. Black and galvanized sheets constitute the only weak spots in the market at present, and even in these descriptions there is a strengthening tendency. Contrasting with relative dullness in the first week of the month, trading now is lively.

Demand Is Unabated

Detroit, Jan. 16.—Warehouse steel prices show no change this week, although demand continues unabated for bars, bands and structural shapes. This in part is due to large buyers being unable to obtain good delivery from mills. Warehouse jobbers declare they feel the tightening of deliveries in some lines, which is effecting present stocks somewhat.

Tin Plate

Consumers Continue to Offer Large Tonnages—Shipments Are Deferred

TIN PLATE PRICES, PAGE 198

Pittsburgh, Jan. 16.—Tin plate consumers continue to offer attractive tonnages for shipment during the first half but find considerable difficulty in obtaining desirable positions on makers' books. It is only by considerable figuring and changing around that makers can find room for additional rollings in May or June. Some sizable lots of tin plate for oil containers have been offered large makers here for shipment in April although so far the business has not been accepted. In connection with one interest, the American Sheet & Tin Plate Co. is endeavoring to satisfy its wants in May and June. In addition to this oil business some general line can and food container tonnage appears. Makers are operating on the basis of 85 per cent of capacity for the first half. That level of operations represents the average of all plants, the American company having reached 85½ per cent the past week. It will shortly add some tin mills in the Wheeling district now that the Carnegie Steel Co. has been able to add two blast furnaces at Bellaire, O., where it soon will be making steel. Independents have averaged 85 per cent for some time although here and there a plant is down, claiming to be unable to sell at the present market price of $4.75 per base box, 100 pounds Pittsburgh. Included in the idle list is the plant of the American Steel Co. at Waynesburg, Pa. The McKeesport Tin Plate Co., McKeesport Pa., is running practically full with 44 tin mills active. Other tin plants are on a full operating basis.

Interest in the tin plate trade largely is centered in "canned foods week" March 3 to 10, in view of the increasing popularity of canned foods. It is estimated that the California food pack alone this year will require 3,000,000 base boxes, which represents 1,250,000,000, No. 2 cans, or 10 cans of food for every person in the United States. That, of course, is but a portion of the total food pack since between 30,000,000 and 35,000,000 cases of peas, corn, tomatoes and milk are packed annually, 24 to 48 cans per case.

Sheet Sales Still Heavy

Recent Bookings Insure Operations at High Rate Through First Quarter—Chicago Mill Covering for Second—Prices Firm

SHEET PRICES, PAGE 198

Pittsburgh, Jan. 16.—So far there has been no noticeable diminution of sheet orders, and the movement started in December which resulted in heavy order books for independents and the American Sheet & Tin Plate Co., is continuing into January. The buying in December, which evidently was withheld as long as possible to prevent shipments being included in inventories, has filled up the larger plants with all the sheets they can produce in the first quarter and part of the second. The American company is understood to be in a position where business on some grades has to be refused for shipment even as late as June, and this situation soon will apply to practically everything it produces. At present the leading interest is operating at 89 per cent of capacity. It does not hope to exceed 90 per cent for some time owing to a labor shortage, especially in the galvanizing departments. This shortage does not permit it to run its galvanizing departments more than 60 or 65 per cent. Independent manufacturers have all the business they can produce for some weeks on the present operating basis of 85 to 90 per cent. Buying has been particularly heavy in automobile sheets and those used in building construction. In some few cases producers are indifferent to additional orders for galvanized sheets although they can find room for more black sheet specifications for prompt shipment. Sheet consumption is expected to proceed at a high rate over the first half. Prices continue unchanged, blue annealed, black, galvanized and full-finished automobile sheet prices of the American company being 2.50c, 3.35c, 4.35c and 4.70c, base Pittsburgh, respectively. Some independent makers have quotations up to 2.75c on blue annealed although the general selling price seldom is higher than 2.60c. While up to 5.00c is quoted on 22-gage full finished sheets, 4.85c is the general figure involved in the going business. The highest quotations noted on black and galvanized so far are 3.50c and 4.50c, respectively, although in some quarters it is expected that premiums above those levels will be offered by users for desired deliveries.

Market Continues Strong

Youngstown, O., Jan. 16.—With sufficient sheet business in hand to warrant operations well into next month, two sheetmakers here have withdrawn from the market. A majority of mills are well booked on galvanized which was taken at 4.35c, Pittsburgh, but are in a position to accept tonnages of black to fill weekly rolling schedules. Higher sheet prices are anticipated, and an advance of $3 a ton is mentioned on black and galvanized. In view of this possibility makers generally are slow to accept sheet tonnages for shipment later in the quarter. A producer of blue annealed in the upper part of the valley has increased his price to 2.75c, Pittsburgh. It is difficult to obtain galvanized sheets in this district at 4.35c Pittsburgh, in view of high production costs and spelter prices. Inquiry for one-pass black this week assumed larger proportions. One inquiry called for 3000 tons of 26 gage while several were current for carload lots ranging from 26 to 29 gage. Some disposition is apparent to avoid booking much tonnage of light gage black in view of more attractive specifications offering. The market for high-grade sheets continues strong with the only district maker unable to further his obligations. If tonnages of this grade were available no difficulty would be had in getting 5.00c Pittsburgh.

Covering for Second Quarter

Chicago, Jan. 16.—Both producers of steel sheets at Chicago are sold for all they can produce during first quarter, and the larger maker now selling for delivery at convenience undoubtedly is covering second quarter production. Consumers here who have not bought to meet their requirements can obtain further supply only from eastern mills, where prices are about $3 per ton higher than the nominal figures quoted by Chicago mills. It appears certain that western users will not be able to obtain further supplies with Chicago mills until books are opened for second quarter.

More Buyers Closing

Philadelphia, Jan. 16.—Sheet business has materially improved, partly by reason of belated buyers closing. Numerous instances are noted of consumers paying more than they could have done some weeks ago. The price level is tending higher toward the advances made by some companies recently, but lower figures still are being done. Blue annealed is obtainable at 2.60c, Pittsburgh, but there is an increasing tonnage at 2.75c. Black sheets are 3.35c, with some mills quoting 3.50c. Some galvanized sheets still are available at 4.35c, but most of the business is going at 4.50c.

Midvale Calls Meeting

Stockholders of the Midvale Steel & Ordnance Co. will meet in New York and those of Cambria Steel Co., a subsidiary, in Philadelphia, March 12, to approve the sale of properties to the Bethlehem Steel Corp. The stockholders also will be asked to approve the formation of a new company to acquire and operate the Nicetown properties and to decrease the total amount of authorized Midvale capital stock to $5000, as it is intended to maintain the corporate existence of the Midvale Steel & Ordnance Co. The Midvale company will receive $95,000,000 of par value common stock of Bethlehem Steel Corp. as a result of the sale.

In order to provide for the expansion already accomplished the Defiance Screw Machine Products Co., Defiance, O., has authorized an increase in its capitalization from $25,000 to $600,000, President Sidney Thompson has announced. No stock will be sold.

Shape Volume Expanding

December Awards Show Unusual Gain of 20 Per Cent—New Work Large—18,000-Ton Job Out at New York

STRUCTURAL SHAPE PRICES, PAGE 198

Washington, Jan. 16.—A continuance of the building boom this spring is forecast by the upward swing of structural steel sales in December. The census bureau states that December bookings were 20 per cent greater than November, making a turning point in the seasonable decline, one month earlier than usual. December sales as reported by 141 companies with a monthly capacity of 215,210 tons were 125,479 or 58.3 per cent of capacity. This compares with awards of 106,315 tons and 48.4 per cent of capacity in November. The census bureau estimates structural steel awards in 1922 were 1,929,400 tons or 64.3 per cent of capacity. In 1921 awards were 997,200 or 35.1 per cent of capacity.

Monthly structural awards as reported by the bureau of census for the past year are as follows:

Month	Per cent	Tons
December	58.3	125,479
November	48.4	106.315*
October	57.3	126,535
September	64.1	141,418
August	68.3	150,700
July	68.9	152,025
June	73.4	162,139
May	81.8	180,558
April	89.9	198,529
March	77.0	139.306
February	43.5	78,700
January	40.0	72,100

*Reports from two companies missing.

Much Tonnage Is Pending

New York, Jan. 16.—Fully 65,000 tons of structural work is being actively figured in this district, and with the exception of possibly 10,000 tons, all has come out since the first of the year. Orders for the past week have been rather slow, but the next 10 days or so are expected to see the placing of heavy business. The outstanding inquiry calls for 18,000 tons for the new Equitable building in the Pennsylvania terminal district, this business being in prospect for several months. Other sizable inquiries include 8000 tons for the Roosevelt hotel and 300 tons for the George Washington high school. Shape prices are moving upward, some mills now quoting 2.10c, Pittsburgh, with others expected to follow shortly. Fabricated material is also advancing. Several builders have come into the market with specifications not fully completed in an effort to place business before further advances go into effect, and deliveries become further extended.

The leading independent has just advanced Bethlehem sections to 2.20c, Pittsburgh. This, however, is about equivalent to 2.10c for standard shapes.

Building Holds Up Well

Chicago, Jan. 16.—Although awards of structural material during the past week were less than the preceding period, the total tonnage involved in projects placed in the Chicago district is unusually large for the season of the year, especially when preceded by as heavy buying as has been done so far in January. Some difficulties are being met in putting through some projects; legal entanglements holding up completion of the Roosevelt road viaduct at Chicago in which 4020 tons is involved, and the Union League club building also being delayed until a later date. This involves 4800 tons. Plain material is difficult to obtain from mills, as the output of both Chicago producers practically has been covered for first quarter. The quotation is now uniform at 2.20c, Chicago mill, by both makers.

Larger Jobs Come Out

Pittsburgh, Jan. 16.—In addition to numerous small lots of structural material ordered for various jobs in this locality, a few larger tonnages recently have been placed. These include the building at Charleston, W. Va., for the Libby-Owens Sheet Glass Co., 1250 tons to the American Bridge Co. This latter interest likewise received the award of a cement plant at River Rouge, Mich., for the Ford Motor Co. Considerable inquiry is pending here for work in New York state as well as numerous schools in this territory. Bids are being taken upon the Peabody high school annex, Pittsburgh, approximately 600 tons, and numerous other school projects in this territory involve an aggregate of between 1000 and 2000 tons. While prices on raw material are getting firmer, from 2.00c to 2.10c, Pittsburgh, now being the quotable market, prices on material fabricated and erected still leave much to be desired. According to leading fabricators, competition still is keen and many shops apparently need work badly as indi-

Prices Are Advancing

Philadelphia, Jan. 16.—Shape demand here is increasing, eastern mills booking considerable tonnages of western business. Operations are increasing. Prices on new business have been advanced by all independents to a minimum of 2.10c, Pittsburgh, with some asking as high as 2.15c. The Steel corporation is asking 2.10c on most business with an absolute minimum of 2.00c. All makers are withdrawing their former lower prices.

Little Actual Business Current

Cleveland, an. 16.—Quietness prevails in structural activity in this district. Although several projects are under consideration, few have reached what might be termed an active position. Although the tone is still optimistic, some doubt is expressed as to the amount of business which will be closed during the next few months. Labor shortages and labor troubles are believed to be important factors in building activity during the coming spring and summer. Prices are tending toward higher levels. With mills well booked, shape prices range from 2.00c to 2.20c, Pittsburgh.

CONTRACTS PLACED

Awards reported this week ..... 16,077 tons
Awards reported during previous two weeks ..... 44,655 tons

2800 tons, Mecca temple, New York City, to Levering & Garrigues.

1500 tons, cement plant for the Ford Motor Co., River Rouge, Mich., to the American Bridge Co., Pittsburgh.

1400 tons, shaft for Brooklyn-Staten island tunnel, reported last week as placed, to New York Shipbuilding Corp.

1400 tons, highway bridge, Glasgow, Mo., to Mt. Vernon Bridge Co.

1400 tons, building at Fifth avenue and Tenth street, New York, reported awarded to Taylor Fichter Steel Construction Co.

1250 tons, building for the Libby-Owens Sheet Glass Co., Charleston, W. Va., to the American Bridge Co., Pittsburgh.

1100 tons, warehouse, Fifty-second street, New York, to A. E. Norton, Inc.

1100 tons, apartment, West 110th street, New York City, to Bethlehem Fabricators, Inc.

1000 tons, transmission towers for Phoenix Utilities Co., New York City, to Lehigh Structural Steel Co.

746 tons, Central Life Insurance Co. building, Chicago, to Morava Construction Co.

679 tons, reinforcement of short route viaduct for Illinois Central Railway Co., Louisville, Ky., to Virginia Bridge & Iron Co.

650 tons, J. L. Hudson store building, Detroit, to Russell Wheel & Foundry Co.

600 tons, Meyer-Kiser bank, Indianapolis, to Insley Mfg. Co.

600 tons, hospital, Providence, R. I., to Lehigh Structural Steel Co.

450 tons, telephone building, Philadelphia, to McClintic-Marshall Co.

372 tons, beams, columns and channels for Sand Springs Supply House, Sand Springs, Okla.

350 tons, market building at Thirteenth and J streets, Sacramento, Cal., to the California Steel Co.

300 tons, garage, Sheffield Farms, Inc., New York City, to George A. Just.

250 tons, Mutual Trust building, Philadelphia, reported previously as awarded to McClintic-Marshall Co., actualy awarded to Bethehem Fabricators, Inc.

225 tons, Breyer Ice Cream building, Philadelphia, to American Steel Co.

215 tons, bridge work for Lafayette and Harrison counties, Missouri, to American Bridge Co.

200 tons, shapes for a bridge in Hamburg township, near Buffalo, N. Y., to the Independent Bridge Co., Pittsburgh.

200 tons, shipping building, for Wheeling Steel & Iron Corp., Portsmouth, O., to Riverside Bridge Co.

200 tons, gas holder for Texas Co., Caspet, Wyoming, Stacey Mfg. Co.

190 tons, one 71-foot through plate girder span, Eighth avenue viaduct, Madison Division, Chicago & Northwestern Railway Co., to Milwaukee Bridge Co.

CONTRACTS PENDING

18,000 tons, building for Equitable Life Insurance Co., Pennsylvania terminal district, New York, after being held in abeyance for several months now up for figures. Thompson-Starrett Co., engineers in charge.

8000 tons, power station for city of Detroit, inquiries out.

8000 tons, Roosevelt hotel, Grand Central terminal district, reported previously as contemplated, up for bids.

4800 tons, Union League club building, Chicago, bids returned and new bids to be asked later.

4300 tons, 25-story building, Broadway, New York City, pending.

4020 tons, Roosevelt road viaduct for Chicago Union Station Co., revised bids asked for Jan. 23.

3000 tons, two loft buildings, each involving 1500 tons, West Fortieth street, New York City, bids up.

3000 tons, George Washington high school, New York, bids asked; previously mentioned as contemplated.

2000 tons, Elk's building, Philadelphia, bids to be asked soon.

1500 tons, Young Men's Hebrew Association building, Philadelphia, bids to be asked soon.

1500 tons, addition to mill of Columbia Steel Co., Pittsburg, Cal., pending.

1200 tons, Life Insurance Co. of Virginia building, Richmond, Va., pending.

1200 tons, track elevation, Long Island railroad, New York City, bids asked.

700 tons, store, office building and garage for New York Telephone Co., project revived and second set of bids asked.

600 tons, Peabody high school annex, Pittsburgh; bids close Jan. 25.

500 tons, government swimming tank, Annapolis, Md., bids asked.

400 tons, additional tonnage for bridgework for Chesapeake & Ohio railroad.

300 tons, viaduct, Public Service Corp. of New Jersey, Seawarren, N. J., bids asked.

300 tons, building for U. S. Radiator Corp., Detroit, The Austin Co., general contractor.

225 tons, Syony creek bridge for highway commission of California. A. W. Kitchen low bidder.

Tonnage not named for outbound freight house at Harrison street, Chicago, for Chi-

cago, Burlington & Quincy railroad, bids asked for Jan. 24.
Tonnage not stated, building for Atlas Foundry Co., Cleveland, bids asked.

Another Advance

Made in Price of Ferromanganese—Tonnage of Spiegel Wanted

FERROALLOY PRICES, PAGE 198

New York, Jan. 16.—On Friday and Saturday, importers of ferromanganese received cabled instructions from their principals advancing ferromanganese by $5 a ton. The new price is $107.50 duty paid tidewater. This is the second advance or a total of $7.50 within 10 days.

Importers, as usual, gave consumers a chance to place orders at the previous price of $102.50 and it is believed at least 7000 tons was booked by New York sellers. Consumption of ferromanganese is going forward at a brisk rate owing to the heavy steelworks operations and sellers say they expect a shortage of this metal will develop before July. Some of the business recently placed involves deliveries over the entire second half.

No German ferromanganese is offered at this time owing to the lack of assurance as to how the French invasion of the Ruhr district will affect deliveries.

The largest inquiry in spiegeleisen for some time involves 5000 tons for an eastern consumer. Demand is good. Sales of the past week involved about 1000 tons, making a total of at least 8000 tons since Jan. 1. Compared with ferromanganese, the price of spiegeleisen is low, the market being $32 to $33 furnace for 20 per cent metal in good sized tonnages for the first and second quarters. On carloads around $35 furnace is quoted for 20 per cent metal.

Higher Prices Bring Quietness

Pittsburgh, Jan. 16.—Since the advent of higher levels, quietness in the ferroalloys market has been more marked, particularly since the second advance in ferromanganese was announced Jan. 12. On Jan. 5 it went up $2.50 but the increase of Jan. 12 was $5, taking the seaboard price on both English and domestic material to $107.50 or $112.29 respecitvely delivered Pittsburgh common points, for the 80 per cent grade. Sales at the $102.50 figure were excedingly limited, none at all being reported by domestic makers and only one or two involving 100 tons each of the imported metal.

English Sell Good Tonnage

Philadelphia, Jan. 16.—Very little domestic ferromanganese has figured in the past week's business. Domestic makers now have followed the advance of the English metal to $107.50, furnace. It is learned that the sales last week of English ferromanganese at the old price of $102.50, tidewater duty paid, aggregate at least 8000 tons. All importers of ferromanganese now are quoting $107.50, tidewater duty paid. The Lavino Furnace Co. is lining its Lebanon, Pa., stack and is expecting to light it on ferromanganese in a month or six weeks.

Railroad Buying Is Active

Recent Awards of Equipment Include Over 510 Locomotives—Car Buying Is in Good Volume—Small Orders Placed

RAILRAOD TRACK MATERIAL PRICES, PAGE 198

New York, Jan. 16.—Authorization by directors of the Pennsylvania railroad for the erection of 300 locomotives is a feature of the eastern railroad market. Of this number, the Pennsylvania will build 125 in its Altoona, Pa., shop, award 100 to the Baldwin Locomotive Works, and arrange for the construction of the remaining 75 locomotives later. Other recent orders include 78 for the Union Pacific, 50 for the Chicago & Northwestern and 42 for the Canadian National railroad. Locomotive inquiries include 15 for the St. Louis Southwestern, 50 for the Illinois Central, and 40 for the Rock Island. This latter inquiry was reported as placed, but later denied by the railroad. Car buying in this district is light.

Chesapeake & Ohio railroad is inquiring for 3000 tons of tie plates.

Places Rail Order

Cleveland, Jan. 16.—The Akron, Canton & Youngstown railroad has placed 1500 tons of rails with the Carnegie Steel Co.

Car Buying Holds Up

Chicago, Jan. 16.—Placing of railroad cars with builders continues to be the feature of the iron and steel market as it relates to railroads. The Chicago & Northwestern railroad has confirmed the purchase of 3000 cars. Other purchases total 3575 cars, practically all of which will be built in Chicago shops. Inquiry has come out for about 2500 additional cars and a western railroad is said to be about to distribute 6000 cars to builders during the present week. Buying of track fastenings continues in somewhat less volume than formerly, but one producer during the past week booked a total of about 10,000 kegs of spikes and bolts and several lots of tie plates and splice bars.

Ordering in Small Lots

Pittsburgh, Jan. 16.—The aggregate of light rail business from week to week is fairly heavy, made up mostly of single orders involving from 50 to 100 tons each. These are coming from coal companies, and affiliated interests often order larger tonnages. No difficulty is being experienced in receiving 2.15c Pittsburgh.

Track accessories sellers report that they still are working upon business booked some time ago, receiving specifications from week to week. On tie plates they are well booked into the second quarter and now are naming a minimum of 2.45c although most of the business on the books was taken at 2.25c to 2.35c. In connection with spikes, they are not booked so far ahead and standard spikes are being increased from 2.75c to 2.90c, base Pittsburgh. Demand is fairly heavy, which likewise is the case in connection with small spikes on which the price is unchanged at 3.50c. In some directions, a short time ago 3.25c was available, but it is reported here that those making that figure now have all the business they want and likewise are meeting the 3.50c level. Track bolts are unchanged in price and the demand is fairly heavy.

Locomotives Reported Booked

Philadelphia, Jan. 16.—The American Locomotive Co. is reported to have booked 40 locomotives for the Rock Island railroad. Heavy orders for tieplates, amounting to between 5000 and 10,000 tons, have been placed by eastern railroads during the past week. Also many railroad orders for miscellaneous materials have been placed.

CAR ORDERS PLACED

Baltimore & Ohio railroad, 1000 box cars, to Illinois Car & Equipment Co.
Southern Pacific railroad, 575 general service cars, to the General American Tank Car Corp.
Rock Island railroad, 500 automobile cars, to the Bettendorf Co.; 250 refrigerators, to the General American Tank Car Corp. and 250 flat cars to the American Car & Foundry Co.
The Ulen Contracting Corp., 35 flat cars to Magor Car Corp.
A. B. C. Refrigerator Transit Co., New York City, 500 refrigerator cars to Merchants Despatch.
United Fruit Co., 100 flat cars for the Truxillo railroad, Honduras, to Magor Car Corp.
Canadian National Railways, 1000 box cars to National Steel Car Corp.; 100 box cars and 100 ballast cars to Canadian Car & Foundry Co.; 500 box cars, 100 general service cars and 100 coal cars to Eastern Car Co.
Westmoreland Coal Co, 200 hopper cars to Pressed Steel Car Co.
New York Central, 60 refrigerator cars to Merchants Despatch.

CAR ORDERS PENDING

Southern Railway & Navigation Co., 300 box cars, bids asked.
Great Northern railroad, 500 additional automobile cars, 1000 in all, bids asked.
Chicago, North Shore & Milwaukee railroad, 15 gondolas, bids asked.
Illinois Central railroad. 125 cabooses, bids asked.
Chicago, New York & Boston line, 100 steel underframes, bids asked.
Universal Portland Cement Co., 300 box cars, bids asked.
Bangor & Aroostook, four baggage cars, bids asked.
Central of Georgia, six miscellaneous coaches, bids asked.
Baltimore & Ohio, four dining cars, bids asked.
Reading railroad, 1000 50-ton box cars, bids asked.
Philadelphia Rapid Transit Co., 100 street cars, bids asked.
Mobile & Ohio, 500 box cars, 200 hopper cars and 100 stock cars; bids asked.
Noyes Buick Co., 50 flat cars, bids asked.
New York, Chicago & St. Louis, 500 hopper cars; bids asked.
Buffalo & Susquehanna, 500 hopper bodies; bids asked.

Manganese Ore Rising

New York, Jan. 16.—Due to heavy European buying, stocks of manganese ore in India and Brazil have been very much reduced and prices now are ascending. A domestic consumer during the past week offered to place a large tonnage of Indian ore at 29½ cents per unit, c.i.f. tidewater, but a cabled bid at this figure was refused. This tonnage now is under negotiation at 31¼ cents per unit, tidewater. No Caucasian ore is obtainable at this time owing to the fact that serious floods in the Caucasus have damaged the railroads to the extent that it is impossible to ship ore to the coast. It is not expected that shipments of Caucasian manganese ore can be resumed prior to March 1.

Concrete Bar Jobs Grow

Inquiries Continue To Show Increase Although Actual Placing of Business Declines—2.50c Is Obtained on Small Lots

REINFORCING BAR PRICES, PAGE 198

Pittsburgh, Jan. 16.—Awards in connection with concrete bars continue to be confined to small lots of 80 to 100 tons each although inquiries are plentiful for larger tonnages. These mostly are for grade schools or high schools in western Pennsylvania where school bonds are tax-free. Work of this nature pending involves in excess of $2,000,000 and includes the Peabody high school annex, Pittsburgh, 100 tons; the Carrick, Pa., junior high school, 100 tons; Harrison township high school for Brackenridge borough, Pa., 100 tons; and other schools in O'Hara, Collier and Robinson townships, each of which involves much smaller lots of concrete bars. Bids too, are being taken upon a building for the Linde Air Products Co., Woods Run, Pa., and on the Sacred Heart church, Jeannette, Pa. Both jobs will involve about 100 tons. The concrete bar market is quotable at 2.00c to 2.25c, base Pittsburgh, although as high as 2.50c has been obtained for less-than-carload lots.

Business Slow Coming Out

Cleveland, Jan. 16.—Practically no awards for reinforcing bars were made in this vicinity during the last week. Many projects are under consideration, however, some of them involving considerable tonnage. Inquiries which are current indicate that much business may be expected to develop within the next two or three months. It is predicted that both building activity and road construction will require large tonnages. At present jobbers are kept busy submitting estimates as new jobs are presented for consideration. Small tonnages of bars from warehouse in less than 100-ton lots, continue in demand. Prices on reinforcing bars remain firm at 2.00c, Pittsburgh.

Bar Tonnage Keeps Up

Chicago, Jan. 16.—In spite of the midwinter season, buying of reinforcing bars for construction work continues with scarcely a check. Important tonnages taken by sellers in this district during the past week total more than 2200 tons. In addition to this tonnage, a large aggregate made up of small purchases also has been booked. Selling has been done to an extent that makes observers wonder where the steel will be obtained, as it appears that some dealers must be oversold. Prices are firm at 2.20c, Chicago mill, and 2.50c, Chicago warehouse, although one dealer is now asking 2.30c, mill, in the effort to avoid taking tonnage. Prices probably will be advanced Feb. 1 to a basis of 2.65c, Chicago store, several companies having announced this increase.

CONTRACTS PLACED

Awards reported this week..... 5,385 tons
Awards reported preceding two weeks 44,655 tons

1600 tons for highway work in St. Louis county, Minn., near Duluth, to Jones & Laughlin Steel Co.
1000 tons, extension to pier 4, Puget Sound navy yard, to Pacific Coast Steel Co. General contract to Henry & McFee, Seattle.
400 tons, United States Veterans' hospital, Chillicothe, O., to the Kalman Steel Co.
300 tons, building for Elks club, Louisville, Ky., to the Kalman Steel Co.
300 tons for sewage disposal plant at Cisco, Tex., to Truscon Steel Co.
250 tons, highway work for the state of Missouri, to the Corrugated Bar Co.
250 tons for highway work for the state of Iowa, to the Concrete Steel Co.
250 tons, Thomas Jefferson high school building, Cleveland, to the Kalman Steel Co.
175 tons, foundation for the University of California stadium, to Edward L. Soule Co., San Francisco.
150 tons for garage on Juneway Terrace, Chicago, to Kalman Steel Co.
150 tons, Addison school, Cleveland, to Republic Structural Iron Works.
125 tons, refinery for Lion Oil Co., Pearson, Ark., to the Corrugated Bar Co.
125 tons, apartment on Jackson and Laguna streets, San Francisco, to K. E. Parker Co.
110 tons, Municipal elevator at Norfolk, Va., to the Concrete Steel Co.
100 tons, garage on Stephenson street, San Francisco, to Gunn, Carle & Co.
100 tons, school building, Hancock, Mich., to the Corrugated Bar Co.

CONTRACTS PENDING

800 tons, building for Gimbel Bros., Milwaukee, bids in.
500 tons, 10-story building for San Joaquin Light & Power Co., pending.
500 tons, Katzinger building, Chicago, bids in.
300 tons, plant addition for General Fire Extinguisher Co., Warren, O., bids in Jan. 16.
300 tons for highway work in Jackson county, Mo., pending.
160 tons, Latin quarter building, Chicago, bids asked.
150 tons, apartment building, 1400 Lake Shore drive, Chicago, bids in.
140 tons, factory building for the United States Radiator Corp., Edwardsville, Ill.
125 tons for highway work in Polk Co., Iowa, pending.
100 tons, plant for Rome Brass & Copper Co., Chicago, bids in.
100 tons, Peabody high school annex, Pittsburgh; bids close Jan. 25.
100 tons, Carrick, Pa., junior high school; bids in.
100 tons, Harrison township high school for Brackenridge, Pa., borough; bids close Jan. 18.
Several hundred tons, for $3,000,000 state bridge over Raritan river, Perth Amboy, N. J.; bids to be asked Jan. 25.

Pipe Mills

Being Urged To Accept More Tonnage —Consumers Anticipate Needs

PIPE PRICES, PAGE 198 AND 260

Pittsburgh, Jan. 16.—Considerable pressure is being brought to bear upon the pipe mills not only for deliveries upon old orders, but to have them accept additional business. Jobbers and users are anticipating their needs for several months ahead and expecting higher prices are anxious to place orders upon makers' books for twice or three times their needs. Deliveries still are much deferred, particularly in standard pipe, from 8 to 12 weeks bring the rule notwithstanding an 80 per cent average operation. The general market remains $4 per ton below the prices announced recently by the Wheeling Steel Products Co., Wheeling, W. Va. Others, however, are intimating higher levels will be general before long, based upon increasing costs.

In connection with line pipe, the order for the 20 miles of 8-inch from the Pure Oil Co. is understood to have gone to a Wheeling, W. Va., pipe maker. So far the Arkansas Natural Gas Co. order for 138 miles of 12¾-inch is withheld and is not expected to develop until after its merger with the Union Oil Co. of California is completed, which merger is to take in the Transcontinental Oil Co. as well. Oil country jobbers are presenting orders for as much as 1000 to 2500 tons of pipe at a time to makers here and in the valley. One typical inquiry issued late last week called for approximately that maximum tonnage and involved 158,000 feet of 4¼ to 15½-inch assorted 15 to 70-pound casing. The Standard Oil Co.'s subsidiaries continue to order and inquire for lines of various size. Most of these are relatively small, 15 to 20 miles in length. Several 150 to 200-mile propositions are pending.

To Close on Tonnages

New York, Jan. 16.—Action is expected within the next day or so on 750 tons of cast iron pipe, reported as pending for the water department of this city, and 300 tons for New Bedford, Mass. While little other muncipal work is pending, demand coming out from private sources is heavy. One large pipemaker said the market is as active for this season as in any time in 10 years. Prices are steady.

Heaviest January Inquiry

Chicago, Jan. 16.—Never in the memory of the oldest seller of cast iron pipe has inquiry and selling been as heavy in January as it is at present. Makers of pipe can see the time approaching rapidly when their shops will be overloaded. Last winter a heavy inquiry was expected for January, but it failed to appear and this year the opposite condition has existed. Bids were opened at St. Paul Jan. 8 on 9000 to 10,000 tons of pipe on which awards are expected this week. The Detroit City Gas Co. is in the market for 5000 to 6000 tons of gas pipe. Bids will be opened Jan. 16 at Cincinnati on 1000 tons of water pipe.

Makers Taking More Tonnage

Birmingham, Ala., Jan. 15—Lettings for cast iron pipe and pressure pipe continue to be booked by makers in the Birmingham district and announcement is made that there is a large amount of the product to be delivered on orders. Specifications are out on some round tonnages. All quotations for pressure pipe remain firm with indications of an early advance. Soil pipe is in demand and orders being booked indicate steady operations for months. The prices for soil pipe after three advances are strong. Output of this product must be heavy to meet requirements.

Wire and Nails

In Heavy Demand—Makers Allocate Tonnage—Annealed Wire Up

WIRE PRICES, PAGE 198

Chicago, Jan. 16.—Makers of wire and nails find it necessary to examine each inquiry carefully and to book only such tonnage as is proportionate to the buyer's needs. Under these circumstances, no buyer is receiving as much as he desires and only old customers of the maker are able to obtain any consideration. Production by the leading interest is now up to about 77 per cent of capacity, which is as much as can be obtained under

the present supply of raw material. Demand is for all sorts of wire and other products and comes from a wide spread of territory. No stocks are being accumulated by mills or by jobbers and material moves directly to consumer. Two levels of price continue, wire being quoted at 2.45c, Pittsburgh, and nails at 2.70c, Pittsburgh, by the principal producer, while most independent mills quote 2.55c and 2.80c, Pittsburgh, respectively.

Instigate Charge For Annealing

Pittsburgh, Jan. 16.—Wire products makers are making an effort to inaugurate a charge for annealing, which process is said to cost in excess of $3 per ton. The Pittsburgh Steel Co. and others this past week announced an increase from 2.55c to 2.70c, base Pittsburgh, for annealed wire, an advance of $3 per ton from the level reached late in December. This custom of charging for annealing is expected to become general. It is understood the American Steel & Wire Co. too, is charging 15 cents per 100 for annealing although its price on plain wire still is understood to be 2.45c, making the annealed wire quotable at 2.60c. Demand for all wire products is heavy, particularly for mixed carloads of wire and nails from jobbers and for larger orders of barbed wire and fencing for the spring trade.

Rationing Available Tonnage

Cleveland, Jan. 16. Demand for wire products is so heavy in the face of the restraint upon increased production caused by labor and other difficulties that producers are obliged to carefully apportion their available tonnage to their customers on the basis of past years. The leading interest is understood to be rationing the ordinary run of buyers on the basis of 40 to 60 per cent of 1921 requirements. Inasmuch as the latter relatively were not large, many buyers are finding themselves unable to secure from any source the full tonnage desired. Independent mills also have greatly limited the tonnage they can offer to regular customers in this territory for first quarter.

Purchases Land for New Assembly Plant

Chicago, Jan. 16.—Formal transfer of a 70-acre tract at Hegewisch, Ill., a suburb of Chicago, to the Ford Motor Co., assures the erection of a large assembly plant of four large units on the tract, the first of which will be in operation by May 1. It is announced that closed cars will be built here when the plant is completed and that ultimately 16,000 men will be employed. Access to the lake is afforded by the Calumet river on which the property has 1665 feet frontage. The New York, Chicago & St. Louis railroad will handle traffic for all railroads serving the tract.

Strip Bookings Heavy

Pittsburgh, Jan. 16.—Strip steel sales continue more or less heavy so that makers now are committed for from two to three months ahead on practically a full operation. The usual orders run from a single carload up to 200 tons at a time, with occasional ones involving 500 or 1000 tons. Most of these continue to come from the autmotive industry. This business consists of both hot and cold-rolled strips. The usual market on hot-rolled is 2.75c, that being substantiated in sizable orders taken this week. A short time ago figures under 2.75c were available but only to cold-strip finishers. Cold-rolled strip remains firm at 4.50c, base Pittsburgh.

The Nonferrous Metals

Prices Firm Here on Most Metals Despite Foreign Situation —Zinc Easy—Lead Up—Copper Steady

	Copper Electro delivered	Copper Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Jan. 10.....	14.75	14.87½	38.37½	7.72½	7.00	22.50	6.60	32.00
Jan. 11.....	14.75	14.87½	39.00	7.77½	7.00	22.75	6.62½	32.00
Jan. 12.....	14.75	14.87½	39.25	7.90	7.00	22.75	6.75	32.00
Jan. 15.....	14.75	14.87½	39.12½	7.87½	6.97½	22.75	7.00	32.00
Jan. 16.....	14.75	14.87½	38.75	7.87½	6.95	22.75	7.00	32.00

†Outside market quotation.

NEW YORK, Jan. 16.—The French occupation of the Ruhr has had no important effect here on the nonferrous metal markets, though London is depressed a little. Prices have been firm, excepting for lead, which has advanced sharply to the highest levels in more than two years. For a time sterling exchange was sufficiently strong to effect a net advance in the London price equivalents but now that factor is down. Domestic consumption continues at a high rate, while labor supplies limit production and the metal industries have enough business on books to disregard possibilities in the foreign markets.

Electrolytic copper has been selling at 14.75c, delivered, for all positions, and producers report no difficulty in getting that price from home consumers. On export business 14.95c to 15c, c.i.f. has been done the past week. Some uneasiness has been evinced in the outside market, with some offers of odd lots at slight concessions, but these have not been general or representative. China has been a heavy buyer of copper. Lake copper has been quoted 14.87½c, delivered; casting, 14.25c, refinery.

The zinc market has eased about five points after a long period of dullness in the domestic market, to 6.95c, East St. Louis, as of Jan. 15. Some sporadic export business has been done in the future positions, the price which London is willing to pay establishing our own market for futures. Futures have been quoted down about five points a month. The December 31 statistics of the American Zinc institute showed production of 42,841 tons and deliveries of 44,086 tons, both figures the highest of the year. Stocks were reduced to 18,252 tons as of Dec. 31, 1922, or not much over 10 days' supplies at the December rate of shipments.

The American Smelting & Refining Co. advanced its lead price to 7.50c, New York, Jan. 10, but premiums have been asked and obtained in the outside market, due to shortage of lead. The Bunker Hill property has had to close on furnace, due to shortage of ore, thus cutting in two its production of 4000 tons per month. Outside prices have reached 7.65c, East St. Louis, 7.87½c to 8c, New York.

The tin market has been strong, ranging between 38.50c and 39.50c the past week, due partly to increase in sterling rates to above $4.68 and partly to the strong London market. Today the market was weak. American buying of tin the past week was the largest in months in the open market, tinplate and mixed metal trades covering requirements. Chinese tin sold at a discount of 1½c from Straits.

Antimony has experienced a sharp advance, from 6.60c, duty paid, for spot metal, to 7c. Futures have continued obtainable at 6.60c, duty paid.

Aluminum prices have strengthened, some importers advancing to 23c, delivered, which compares with 24c quoted by the domestic producer for 98 to 99 per cent virgin ingot.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled 24 oz., min....	22.25
High brass	19.00
Zinc, ga. 9 to 18 (plates ½c less)	9.25 to 9.50
Lead, full sheets (cut, ¼c more).	10.25
Aluminum, base 18 ga. and up....	36.40
SEAMLESS TUBES	
High brass	23.50
Copper	25.25
RODS	
High brass, round, ⅜ to 2½ inch	17.25
Naval brass rod.....	19.50
WIRE	
Copper .....16.00 to 16.62½	
High brass	20.00

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.50 to 10.00
New York	9.00 to 9.50
Chicago	9.75
HEAVY YELLOW BRASS	
New York	6.50
Chicago	7.75
Cleveland	6.50
ZINC	
New York	4.00 to 4.25
Cleveland	4.00 to 4.50
HEAVY COPPER AND WIRE	
Cleveland	12.00 to 12.25
New York	11.75 to 12.00
Chicago	12.00
RED BRASS TURNINGS	
New York	8.00 to 8.50
Cleveland	8.25 to 8.75
Chicago	8.75
YELLOW BRASS TUBING	
Cleveland	6.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.25 to 6.75
New York	7.00
Chicago	7.50
ALUMINUM BORINGS	
Cleveland	7.00 to 9.00

By-Product and Beehive Coke Output Gains

Production of by-product coke increased slightly in December, according to the United States geological survey. The total output was 3,063,000 net tons, a gain over November of 138,000 tons. The increase was due partly to the additional day in December. The ratio of production to capacity was 83.5 per cent against 51.8 per cent one year before. The production of beehive coke also increased in December. The following table shows the monthly output of by-product and beehive coke in thousand net tons:

	By-product	Beehive	Total
1917 Monthly average..	1870	2764	4634
1918 Monthly average..	2166	2540	4706
1919 Monthly average..	2095	1638	3733
1920 Monthly average..	2565	1748	4313
1921 Monthly average..	1646	462	2108
1922 Monthly average..	2374	669	3043
October, 1922	2806	876	3682
November, 1922	2925	1138	4063
December, 1922	3063	1233	4296

The production of beehive coke increased sharply in the first week of 1923. Estimates of the geological survey placed the total output at 308,000 net tons. This was three times the output for the corresponding week of 1922. The table of estimated beehive coke production follows:

	Week Ending		
	Jan. 6, 1923	Dec. 30, 1922	Jan. 7, 1922
Pennsylvania and Ohio	246,000	209,000	85,000
West Virginia	18,000	16,000	6,000
Alabama, Tennessee and Georgia	17,000	15,000	5,000
Virginia and Kentucky	16,000	12,000	6,000
Colorado and New Mexico	6,000	6,000	3,000
Washington and Utah.	5,000	5,000	3,000
United States total..	308,000	263,000	108,000
Daily average	51,000	53,000	18,000

Daugherty's Purpose in Labor Probe Defined

Washington, Jan. 16.—In instructing the United States district attorney at San Francisco to probe complaints that the San Francisco Builders' exchange had pledged itself not to sell building materials to contractors employing union labor only, Attorney General Daugherty has repeated a ruling made by him last July 18 to this effect:

That a conspiracy on the part of material dealers not to sell material to a contractor who is not operating under the American plan (open shop) is unlawful.

That an agreement to refuse goods to a contractor who employs only union men is unlawful.

That an agreement to refuse to sell to contractors who are employing more than 50 per cent of union men is unlawful.

That an agreement having for its purpose the refusal to sell to contractors whose employes are union men and who refuse to discharge a portion of the men and engage in lieu thereof non-union men is unlawful.

So far as San Francisco is concerned, Mr. Daugherty has acted so far only to request the local district attorney to investigate complaints. The case is understood to involve the sale of materials only and not the principle of the open or closed shop in itself. In repeating his former ruling Mr. Daugherty endeavored to make clear his department's position that a conspiracy that has for its purpose the destruction of organized labor is unlawful, no less than a conspiracy directed against unorganized or open shop labor.

Unfilled Orders Decline

For the second month in succession, the unfilled bookings of United States Steel Corp. have declined, the total as of Dec. 31 being 6,745,703 tons, or a reduction of 94,539 tons. The highest total in the last three years was 11,118,468 tons, this being reported as of July 31, 1920. Further comparisons follow:

Date	Total	Change, tonnage	Change, per cent	
Dec. 31, 1922...	6,745,703	94,539—	1.39	—
Nov. 30, 1922...	6,840,242	62,045—	.89	—
Oct. 31, 1922...	6,902,287	210,680+	3.14	+
Sept. 30, 1922...	6,691,607	741,502+	12.4	+
Aug. 31, 1922...	5,950,105	173,944+	3.01	+
July 31, 1922...	5,776,161	140,630+	2.48	+
June 30, 1922...	5,635,531	381,303+	7.2	+
May 31, 1922...	5,254,228	157,311+	3.08	+
April 30, 1922...	5,096,917	602,769+	13.4	+
Mar. 31, 1922...	4,494,148	353,079+	8.5	+
Feb. 28, 1922...	4,141,069	100,609—	2.307	—
Jan. 31, 1922...	4,241,678	26,736—	0.0062	—
Dec. 31, 1921...	4,268,414	17,872+	0 004	+
Nov. 30, 1921...	4,250,542	36,287—	0.84	—
Oct. 31, 1921...	4,286,829	273,841—	6.004	—
Sept. 30, 1921...	4,560,670	28,744+	0.63	+
Aug. 31, 1921...	4,531,926	298,398—	6.3	—
July 31, 1921...	4,830,324	287,544—	5.59	—
June 30, 1921...	5,117,868	364,619—	6.2	—
May 31, 1921...	5,482,487	362,737—	6.2	—
April 30, 1921...	5,845,224	439,541—	6.8	—
Mar. 31, 1921...	6,284,765	649,102—	10.32	—
Feb. 28, 1921...	6,933,867	639,297—	8.21	—
Jan. 31, 1921...	7,573,164	574,958—	7.59	—
Dec. 31, 1920...	8,148,122	873,359—	9.68	—
Nov. 30, 1920...	9,021,481	815,371—	8.26	—
Oct. 31, 1920...	9,836,852	537,952—	5.16	—
Sept. 30, 1920...	10,374,804	430,234—	3.56	—
Aug. 31, 1920...	10,805,038	313,430—	5.4	—
July 31, 1920...	11,118,468	139,651+	.7	+
June 30, 1920...	10,978,817	38,751+	0.35	+
May 31, 1920...	10,940,466	580,719+	5.6	+
April 30, 1920...	10,359,747	467,672+	4.51	+
Mar. 31, 1920...	9,892,075	389,994+	3.94	+
Feb. 29, 1920...	9,502,081	216,640+	2.3	+
Jan. 31, 1920...	9,285,441	1,020,075+	11.00	+

Mill Scale Quoted Higher

Philadelphia, Jan. 16.—The mill cinder and scale market opened 1923 business by transactions during the past week, covering first half. Scale was bought actively but there was not much demand for cinder owing to its refractory character. In eastern Pennsylvania scale is about 50 cents higher than last year, while in central Pennsylvania it is about 25 cents higher, being quoted $4.75 to $5.25, delivered eastern Pennsylvania. Cinder is being quoted about the same as last year, namely $3.25 to $3.75, both eastern and central Pennsylvania furnace.

McKinney Is To Replace Two Blast Furnaces

Blast furnaces No. 1 and No. 2 at the River plant of the McKinney Steel Co., Cleveland, will be torn down and replaced with two modern furnaces of 500-tons daily capacity each, according to an announcement of company officials. The two furnaces to be placed are of the hand-filled type of 350 tons daily capacity each and were completed in 1910 and 1911 respectively. The stoves used for the old furnaces will be used with the new furnaces. Ore bins of sufficient capacity to care for the requirements of the new stacks will be constructed. The company will handle its own engineering work. Both furnaces No. 1 and No. 2 are now in blast but will be blown out soon for the reconstruction work.

By the replacing of the two blast furnaces, pig iron making capacity of the company will be increased from 675,000 tons per year to approximately 800,000 tons per year. Steelmaking and rolling equipment of the River works includes 14 100-ton basic open-hearth furnaces, one 1000-ton mixer, six 4-hole soaking pits, a 40-inch reversing blooming mill, a 21-inch continuous billet mill, and an 18-inch continuous sheet bar and billet mill. No additional rolling mill equipment is being considered at the present. The annual capacity of the plant is 700,000 tons of ingots, 1700 tons of steel castings, 245,000 tons of slabs, 240,000 tons of billets and 70,000 tons of sheet bars.

Hibbing Claims Damages

New York, Jan. 16.—Mayor John M. Gannon and R. B. Kreis of Hibbing, Minn., today appeared before the United States Steel Corp. finance committee on behalf of the citizens of Hibbing, claiming damages said to have arisen indirectly through the recent purchase by the Oliver Iron Mining Co. of a 40-acre tract adjacent to Hibbing. No arguments were presented on either side. The committee did not express an opinion on the subject and the matter has been taken under advisement.

Fabricator Organizes

Philadelphia, Jan. 16.—The American Steel Co., has been organized here to engage in the business of structural fabricating. Joseph H. Dalson, is president of the new company. Mr. Dalson was formerly president of the Montgomery Iron & Steel Co., Philadelphia.

America To Get German Trade

Increased Proportion of World Steel Demand Likely Will Be Diverted to United States and Other Nations, Result of Ruhr Invasion—Views of an Expert on Foreign Commerce

BY LUTHER BECKER

OCCUPATION of the Ruhr by the French and the necessary disturbance to the administration of its mining and metallurgical industries will temporarily, at least, promote the iron and steel trade of other countries, no matter what its ultimate effect in world economic relations may be.

Two situations may arise, one of complete co-operation on the part of the German industrialists and the workpeople with the French economic mission; the other involving a policy of passive resistance by the Germans in the Ruhr.

Within the Ruhr, a section comprising an area of the state of Rhode Island, are concentrated over 800 industrial corporations, mining, metallurgical, chemical and others, with 20 per cent of the entire German capitalization. In 1913, the year of Germany's largest output of coal, the Ruhr mines accounted for 60 per cent of the total of 190,100,400 tons. The Ruhr likewise contributed 72 per cent of the country's coke output; yielded 20 per cent of Germany's iron ore production; 55 per cent of the pig iron; 65 per cent of the ingot steel, and 65 per cent of the output of its rolling mils. Through the loss of Lorraine and Upper Silesia, the Ruhr's present output of iron ore, pig iron and steel compared with the whole of Germany is somewhat larger than is represented in these percentages.

Thirteen big consortiums divide among themselves the mining and metallurgical activities of the Ruhr. These in the order of importance with respect to the volume of coal and coke at their disposal in 1921 are, designated by name of person or company in control: Stinnes, Haniel, Krupp, Phoenix, Rheinische Stahlwerke, Thyssen, Hoesch, Mannessmann, Kloeckner, Lothringer, Roechling, Stumm and Mansfield.

According to report, these big concerns have been able to maintain their production of metallurgical coke at the prewar figure, and certain groups have control of more coal than in 1913.

These consortiums operate by a purely financial control method. The Stinnes group, for example, controls many companies in the Ruhr merely by a preponderance of votes in stockholders' and committee meetings. It is these powerful organizations that the French will have to deal with in their occupation of the Ruhr.

Whether the French succeed or fail in the policy they are pursuing, in taking over the administration of industry in the Ruhr, will depend on the attitude of the big industrial concerns toward this peaceful penetration. The successful operation of a nation's industrial establishments depends on the intelligence and efficiency of its people. Failure on the part of the German engineers and workmen in the highly efficient steel mills of the Ruhr valley to co-operate with the French economic mission will result in diminished output, with the consequent rise in cost of production and inability to compete in the world's markets. Moreover, a policy of "passive resistance" by the German mill owners and operatives might resut in a complete breakdown of the steel industry. Should this extreme situation arise, it is highly improbable that the French, assisted by the Belgians, would undertake to operate the Ruhr mills with labor extracted from their own industries. The French have as yet to acquire the experience in steelworks operation on so large a scale. Belgian steel mills have fared well in the world's trade during the past year and the industry is fully engaged with internal and foreign contracts and would hardly be able to supply personnel.

Another situation might arise that would concern Germany outside of the Ruhr, and that revolves around the question of coal production. The economic life of Germany's 60,000,000 people depends largely on the coal output of the Ruhr. Germany's coal reserves have been depleted as a result of coal deliveries to the entente nations during the last two years and a slackening of production will effect all German railroads and factories. Railroads are supplied with coal for two days' operation only. Germany has large quantities of lignite which can be used by certain industrial plants, but it is not adaptable for transportation. The exchange difficulties would prevent the importation of much coal from England, it can very easily be seen.

German iron and steel plants have in recent months won some substantial contracts in the international markets, an outstanding one being 15,000 tons of heavy rails placed by Japanese government railways. Other contracts involve rails obtained in Brazil, and other heavy steel products from various parts of Latin America and the Far East. Deliveries of these rails and other steel materials have yet to be made.

German tradesmen have made intensive drives in every part of the world and by underselling their American and British competitors have succeeded in carrying away a large share of the existing trade. In the aggregate these sales footed up to a huge tonnage, and demoralization in Germany will affect delivery on these contracts.

Reports from German and other sources would indicate that Germany's steel export prices had reached and, in some commodities, passed world-market levels. Nevertheless, Germany, undisturbed, can be counted on as a prominent factor among the steel-producing and exporting nations of the world.

German steelworks are demanding long terms for both internal and foreign deliveries. Reports just received from Germany disclose terms ranging from four to five months on ordinary steel products, six to seven months on fabricated materials, and nearly 12 months for steel specialties. These accumulated orders, totaling perhaps 1,000,000 tons or more, for foreign account, represent unfilled contracts, the bulk of which might be considered as steel goods for which there is an actual demand.

Any disturbance, then, of the activities of the steel mills of Germany leaves the United States, Great Britain and Belgium, insofar as their limited steelmaking capacity will allow, to fill in the vacuums that will be created. Even assuming that no disturbances take place and that no friction arises between the German manufacturers and the French, the very uncertainties of the situation will reflect upon business which otherwise might go to Germany. The reduction of German competition and the return of profitable export prices will open up a larger field for future business.

The author is chief of the iron and steel division, bureau of foreign and domestic commerce.

Steel Ingot

Production for 1922 Shows 72.9 Per Cent Gain Over 1921

Output of steel ingots in December totaled 2,779,890 gross tons, according to statistics compiled by the American Iron and Steel institute from production figures reported by 30 companies, which in 1921 made 87.5 per cent of the total for the country. Production for November aggregated 2,889,297 tons. Thus, the December output showed a decrease of 109,407 tons and was the first month since August to register a loss. However, the December tonnage stands as the third highest produced during 1922, November ranking first and October second.

With the ingot production of the 30 companies for 1922 completed, the total aggregated 29,116,453 tons as compared with 16,826,946 tons in 1921, the increase being 12,289,507 tons, or 72.9 per cent. Open-hearth ingots totaled 23,624,404 tons, making a gain of 10,498,826 tons or 79.9 per cent over the 13,125,578 tons of the preceding year. Bessemer ingots totaled 5,469,213 tons and, compared with the 3,679,682 tons of the year before, made a gain of 1,789,531 tons, or 48.6 per cent. Production of all other ingots in 1922 was 22,836 tons and a gain of 1150 tons or 53 per cent over the 21,686 tons of 1921. These figures show most strikingly the trend of ingot production toward greater use of the open-hearth process.

Following are the institute's production figures for both 1921 and 1922:

1921	Open hearth	Bessemer	All other	Total
Jan....	1,591,281	608,276	3,629	2,203,186
Feb....	1,295,863	450,818	2,796	1,749,477
March..	1,175,591	392,983	2,404	1,570,978
April...	1,000,053	211,755	2,150	1,213,958
May....	1,047,810	216,497	1,543	1,265,850
June....	808,286	193,644	1,476	1,003,406
July....	689,489	113,312	575	803,376
Aug....	915,334	221,116	1,621	1,138,071
Sept...	908,381	265,152	1,207	1,174,740
Oct....	1,269,945	345,837	1,028	1,616,810
Nov...	1,294,371	363,912	1,718	1,660,001
Dec...	1,129,174	296,380	1,539	1,427,093
Total for year.	13,125,578	3,679,682	21,686	16,826,946
1922				
Jan....	1,260,809	331,851	822	1,593,482
Feb...	1,395,835	348,571	616	1,745,022
March..	1,918,570	451,386	795	2,370,751
April...	1,997,465	445,939	1,109	2,444,513
May...	2,214,774	494,893	1,474	2,711,141
June...	2,143,708	487,851	2,918	2,634,477
July ..	2,020,572	464,047	2,485	2,487,104
Aug. ..	1,807,310	404,379	2,893	2,214,582
Sept...	1,911,147	460,127	2,505	2,373,779
Oct. ..	2,352,207	518,010	2,198	2,872,415
Nov. ..	2,360,903	525,945	2,449	2,889,297
Dec....	2,241,104	536,214	2,572	2,779,890
Total for year	23,624,404	5,469,213	22,836	29,116,453

Although the total ingot production for December showed a loss over November, daily production showed an almost negligible increase. This was due to the fact that December had only 25 working days as compared with 26 in November. On an average daily basis the December output of the 30 companies was 111,195 tons, a gain of 69 tons over the 111,126 tons of the month before. Upon this basis and the factor of 87.5 supplied by the institute, the average daily rate of production for the whole country was 127,080 tons in December, a gain of 79 tons as compared with the 127,001 tons of November.

Computed upon the average daily production of December and 311 working days per year, the approximate annual rate of production for the 30 companies during the month was about 34,580,000 tons or 20,000 tons better than the indicated rate of November. On the same basis, the approximate annual rate of output for the entire country was about 39,520,000 tons which, compared with the 39,495,000 tons of November, was an increase of 25,000 tons. The annual indicated rate of production in December was about 106.3 per cent better than the total production for 1921 and was about 9.4 per cent less than the record output of all time in 1917.

Applying the factor of 87.5 to the 1922 total output of the 30 companies of 29,116,453 tons, the indicated production for the whole country of 33,300,000 tons is obtained. This figure corresponds to 19,184,084 tons in 1921 and 40,881,392 tons in 1920.

Wellman's Work

Is Reviewed by Cleveland Associates—Recall Early Days of Steelmaking

The series of meetings on the iron and steel industry being held by the Associated Technical Societies of Cleveland was opened auspiciously Tuesday evening, Jan. 9, at Hotel Winton, when a program on the work of the late Samuel T. Wellman was given by a number of his associates. As outlined in last week's issue, meetings of the series will be held weekly throughout January and February, with a possible meeting in March.

Following a dinner last Tuesday evening, James H. Stratton, engineer of construction, Wellman-Seaver-Morgan Co., Cleveland, traced the development of the open-hearth process in the United States. He read extracts from Mr. Wellman's presidential address before the American Society of Mechanical Engineers, which revealed interesting facts regarding Bessemer's early work with the converter. Other references to this address brought out reasons for the rapid growth of the open-hearth process in the United States.

Ambrose Swasey, past president of the American Society of Mechanical Engineers, spoke briefly of his extensive travels in company with Mr. Wellman. He related their adventures on a trip to the Near East, mentioning examples of ancient and modern engineering which they inspected. He drew an interesting contrast between the methods apparently employed by the builders of the pyramids, and those of engineers engaged in damming the Nile river at the time of the visit. Mr. Swasey also spoke of the excavation for the Suez canal, accomplished almost by hand, and of works of art and engineering in Constantinople, Greece and Rome. He referred to visits to steel plants of France, Germany and England, stating that Mr. Wellman was well known to European steel masters and that equipment designed by him was to be found in nearly every plant. Later Mr. Swasey described another trip, when 700 miles inland in China, he and Mr. Wellman inspected the Hanyang steelworks where equipment of Wellman design was in use.

Other aspects of Mr. Wellman's service to the steel industry were brought out in 5-minute talks by John McGeorge, C. C. Smith, J. Frank Rogers, E. Francis, and F. Moeller. A. D. Hatfield, son-in-law of Mr. Wellman, read a letter from C. A. Otis, founder of the Otis Steel Co., addressed to Mr. S. T. Wellman's father, asking him to prevail upon his son, who had been "making a good record as a builder of open-hearth furnaces," to come to Cleveland to take charge of a new steelworks. As a result of this letter, Mr. Wellman built the first furnaces of the Otis plant, which assumed production in 1873. For 16 years he was in charge of the plant, and according to testimony presented at the meeting, made firebox steel "so good that it commanded a price of from $20 to $25 per ton above that of steel made by other producers." Mr. Hatfield also read a letter from Charles M. Schwab, in which he paid high tributes to Mr. Wellman and to Captain Jones, early Pittsburgh steelmaker.

In conclusion, W. G. Hildebran, assistant secretary, Wellman-Seaver-Morgan Co., read a sketch of Mr. Wellman's life, dictated by him several years before his death and never before published. The most interesting part of this sketch had to do with Mr. Wellman's early work in building open-hearth furnaces and his term of service with the Otis Steel Co., especially at the time he introduced the basic process of steelmaking.

The E. C. Atkins Co., Indianapolis, saw manufacturers, has announced a capital stock increase from $600,000 to $3,000,000. All the new stock is common.

Western Building Heavy

Total for Year in San Francisco Approaches Record Made After Fire in 1907—Sales Hold to Small Lots

San Francisco, Cal., Jan. 12.—Building operations in San Francisco during the past 12 months reached a total of $45,327,205, the second largest sum ever recorded in a single year. The largest total was for 1907, the year following the fire, and was $56,578,844. The number of permits issued during the past year was 8078, a greater number than ever before has been approved in one year. Permits issued in December numbered 538 and totaled $2,439,658. The total increase over 1921 operations was in excess of 100 per cent.

Los Angeles reported 3613 permits issued in December with a total estimated value of $8,955,597, or $213,254 short of the December 1921 total. From Jan. 1 to Dec. 31, 47,397 permits were issued which totaled $121,206,787 as compared with 37,206 permits for the year 1921 with a total of $82,761,386.

Bank clearings in San Francisco during 1922 amounted to $7,274,000,000, an increase of $645,000,000 over 1921. This is the second largest year in the history of the city, the previous high mark being in 1920 when the total was $8,122,064,917.

Bars, Plates and Shapes

Demand for merchant bars is not heavy and bookings comprise, for the most part, small lots. Prices remain unchanged at 2.70c f.o.b. San Francisco. A much better volume of business is being done in concrete bars and numerous awards involving small tonnages are being made.

Bolt and nut demand during the past month has been of satisfactory volume. Large machine bolts cut thread are being quoted at 50-10-10 off while small are quoted at 50-10 off. Rivet business is good and practically all first quarter requirements are being accepted at 3.00c and 3.10c for structural and boiler rivets respectively, while small rivets are held at 65-5 off. The Standard Oil Co. is asking for prices on 125 tons of structural rivets for tank construction work.

Hoop and band men report an increase of over 200 per cent in the business during the past year. The majority of bookings, by far, involve small lots only. Prices have weakened slightly and 2.75c to 3.00c base Pittsburgh is the prevailing range although some of the smaller sizes have gone as high as 3.25c.

Apparently there is to be not let up in tank construction as many companies plan further work. In addition, numerous power projects are planned involving considerable material both for penstocks and pipe lines. The Hetch Hetchy pipe line is expected to be up for figures within 60 days, involving about 10,000 tons. The largest award of the new year involved nine 80,000-barrel tanks, besides small tanks, for the new refinery of the Shell Oil Co., Wilmington, Cal., with a total tonnage of 2700 tons awarded to Riter-Conley Co. The General Petroleum Co. has placed 1000 tons for three 80,000-barrel tanks. The Union Oil Co. has awarded two 80,000-barrel tanks to the Lacey Mfg. Co., Los Angeles involving 600 tons.

Shape business continues in good volume, but is made up mostly of smaller awards involving less than 100 tons. Prices remain unchanged at from 2.40c to 2.50c c.i.f. San Francisco.

Other Finished Material

The San Diego Electric Co. has awarded 400 tons of 7-inch 114-pound girder rails and 160 tons of 127-pound guard rails to the U. S. Steel Products Co. The Pacific Southwest railroad will open bids on Jan. 17 for railroad construction involving 1500 tons of 60 to 75-pound rail.

Cast iron pipe representatives in this district report that business during the past year was double that of 1921. Private demand is quiet. Prices remain unchanged. The U. S. Cast Iron Pipe & Foundry Co. secured 265 tons of 4 to 8 inch for Alhambra and 120 tons of 6 inch for Spokane, Wash. Aberdeen, Wash. will open bids on Jan. 17 for 686 tons of 2 to 16 inch. Watsonville, Cal. has voted bonds for the purchase of 150 tons of 8 and 12 inch.

Standard and oil country pipe continue in heavy demand. Stocks of standard material are badly broken and consumers are pressing for deliveries. Some improvement is reported in this district as regards the car shortage situation. During the past year 1439 new wells were reported to the state oil and gas supervisor as compared with 1287 for the year 1921. Deepening or redrilling jobs numbered 770 as compared with 671 for 1921.

Warehouse

Warehouse interests report December business being at least 50 per cent better than for December 1921. Movement of all lines is good with sheets, pipe and wire products most in demand. No change has occurred in out of stock prices.

Coast Inquiries

Increase as New Year Opens—Pig Iron Demand Is Active

Seattle, Jan. 12.—All branches of the iron and steel trades report the new year opening with increased inquiry. Business is fairly active and while no large tonnages have yet been placed the total is satisfactory. Building is being continued in volume and many new projects have recently been announced, office construction forming a large total. Several small tonnages of reinforcing bars have recently been awarded. The largest order was 1000 tons of bars to the Pacific Coast Steel Co. for the extension of Pier No. 4 at the Puget Sound navy yard.

While no extended railroad construction is planned in this state during 1923, various roads have announced that considerable improvement will be undertaken, such as re-ballasting tracks and laying new rails. Several large logging companies are also planning new roads or extensions into timber tracts.

Comparison of Northwest bank clearings for 1923 show Seattle in the lead with $1,658,144,333. Portland's record was $1,600,507,594 and Spokane $526,855,568.

Pig Iron and Coke

Prices are firm in this market in harmony with rising exchange and demand continues active. Some consumers are well supplied with stocks but the turnover of both pig iron and coke is satisfactory. No domestic pig iron is being sold here, except an occasional lot brought in for some particular purpose. The stocks of foreign coke have been nearly exhausted.

Bars, Plates and Shapes

The steel mill is operating two open-hearth furnaces and business is reported good. Prices are firm and unchanged. Several export orders of reinforcing bars have recently been closed the total being around 800 tons for shipment to China. A lot of 2000 tons of steel billets from the Panama canal have just been discharged here.

Local fabricators have recently purchased fairly sizeable lots of shapes for local contracts. The Pacific Car & Foundry Co. has purchased 2500 tons of plates from the Bethlehem Steel Co. in connection with a large contract for refrigerator cars. Plates are being quoted here at around 2.40c and 2.45c.

Other Finished Material

Jobbers state that the month's business thus far is surprisingly active. While logging camps and lumber mills are resuming, production is being hampered in many cases by high water. However jobbers report strong inquiry for everything in stock, especially bars, sheets, nuts, bolts, spikes, rivets, railroad materials, valves and pipes. Prices remain unchanged.

Old Material

This market reports stronger demand. Stocks are still low although dealers are making every effort to replenish supplies. Prices are firm. No. 1 cast iron scrap is quoted at about $22.50 while steel scrap is firm and ranges from $14 to $18. Japanese buyers are still in the market but they state that prices here and freight rates are practically prohibitive compared with prices offered in Japan.

Furnace Is Ready

New York, Jan. 16.—The Temple Furnace Co., of which Nils Anderson, 114 Liberty street, New York, is president, has put one of its furnaces at Temple, Pa., in shape for operation but no decision yet has been made as to when the furnace will be put in blast.

Witherbee, Sherman & Co. will light their No. 1 furnace at Port Henry, N. Y., Feb. 1. The furnace will be operated on foundry iron.

Ruhr Industrial Activity Normal

Trading Suspended, but Mines, Furnaces and Mills Are Operating—French Steelmakers Likely To Acquire Large Interest in Works—British Market Unaffected—Steel Prices Continue To Rise

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Jan. 15.—Direct advices from Germany indicate that reports of interference with the orderly operation of the coal mines and iron and steel plants in the Ruhr district, resulting from military measures or protest strikes, are exaggerated. The mines, furnaces and mills are operating practically at a normal rate, but trading is virtually suspended awaiting developments.

It is understood here that the French may pay the Ruhr miners and then force compensation from the owners in the form of stock in the leading corporations. The eventual result of the Ruhr occupation, in a business sense, probably will be the acquirng by Lorraine steelmakers of large interests in German coal, iron and steel corporations. This view is confirmed by interviews with prominent French industrialists in Paris last week. There are no signs in French trade of the extraordinary events transpiring. The iron and steel business is expanding. Foundry pig iron has been sold up to 270 francs ($18.36) for February shipment, and prices of steel are higher.

Sterling—$4.66½

The Belgian state railway is selling several thousand tons of old rails to German steelworks, the German bid being the highest. Germany is underquoting Belgian mills on pipe in Holland, Spain and Brazil.

Prices of semifinished and finished steel in Great Britain have advanced on large sales. Moderately heavy buying is being done by the British railroads. Due to large export sales the price of galvanized sheets has advanced £1 ($4.66½) to £18 10s ($86.30). The British market generally is undeterred by developments in the Ruhr. The price of billets has been advanced to £7 10s ($34.99); sheet bars to £7 7s 6d ($34.40); wire rods to £10 5s ($47.82); rails for home use to £8 5s ($38.49) and for export to £7 10s ($34.99).

Production of pig iron in Great Britain in December amounted to 533,700 tons compared wth 495,000 in November, and with 275,000 tons in December, 1921. Production of steel ingots and castings in December was 546,000 tons compared with 585,000 tons in November, and 381,000 tons in December, 1921.

Britain Sees American Competition Increasing

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, Eng., Jan. 5.—The first meetings of the new year have been of a hopeful character, while the number of works operating compares favorably with the meager activity of a year ago. In all districts the prices are hardening, and in pig iron the improvement is very marked.

Sound evidence of returning confidence is the increase of forward buying, which is a general feature reported from all districts. Consumers are coming on the market for the negotiation of supplies to the end of March. This kind of enterprise is not altogether encouraged by smelters in view of the high cost of production and the narrow margin of profit.

In production the beginning of the year has justified expectations, and within the next month a number of furnaces probably will be relighted.

The British furnaces for the present have to rely upon their home customers, American buying being little in evidence. The Barrow area is fairly satisfied with the progress made, from four active furnaces at the beginning of 1922 to 17 at the end of December. The continent is taking more interest in West Coast low phosphorus iron, and the makers are looking for an early return of American buyers. The position, however, has greatly improved as regards Sheffield and South Wales, both of which are taking good parcels of Barrow material. Enlarged engineering demands should call for considerably more iron from the Barrow furnaces.

Sterling $4.64

The semifinished and finished steel departments are decidedly more promising than that of pig iron. Billets maintain their recent advance to a minimum of £7 7s 6d ($34.22) and certain well known firms are insisting on £7 10s ($34.80). Some of the largest billetmakers have not yet resumed, preferring to watch early developments. There is so much reserve plant available that any large expansion of prices would seem to be out of the question. The practical absence of foreign competition is regarded as highly significant. The Belgian minimum has become £7 ($32.48), delivered in Birmingham, as compared with £6 10s ($30.16) recently. A lack of confidence is prevalent as to the ability or the willingness of the continental houses to fufill their contracts for semifinished steel. Belgium is filled up for some time to come.

The steady recovery of the value of sterling in New York is a matter of great interest to the steel trade, indicating a return of American competition whenever circumstances encourage the offering of American steel in the British market.

So far the advances in finished steel have been slight and it is still doubtful whether a general rise in values is to be looked for in 1923. Makers are inclined to move cautiously. Some large expansions of plant, especially in the matter of engineering power, have been carried through particularly at Birmingham and Newport. The new Whitehead Newport works are now complete, and will commence the year with a capacity considerably enlarged. The District Iron & Steel Co., of Birmingham, also has been speeding up its engine power sufficiently to increase its capacity by about 500 tons per week.

The latest report from the Clyde indicates that the Scotch steel business is at last waking up. Some thousands of tons of ship plates have been placed, to meet recent shipbuilding orders. Considerable marine engineering work has also been given out. There are signs of heavy contracts pending for bridge work for home and foreign requirements.

A decidedly hopeful department is that of sheets for which demand is expanding. The Midland mills are getting busier largely to meet the requirements of motor building and to fill the orders of various sheet galvanizing producers. Prices are substantially unchanged in this department

Current Iron and Steel Prices of Europe

Converted into Dollars at Rates of Exchange, Jan. 15

British Market

Home Market Prices. Gross Tons at Works or Furnace.

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	34.99	7 10 0
Sheet bars	34.40	7 7 6
Wire rods	47.82	10 5 0
FINISHED STEEL		
Steel bars, England, ¾ to 3-inch	43.15	9 5 0
Steel bars, England, ⅜ to 3-inch, for export	38.49	8 5 0
Plates, ship, bridge and tank, England	41.99	9 0 0
Plates, ship, bridge and tank, England, for export	39.65	8 10 0
Plates, ship, bridge and tank, Scotland	39.65	8 10 0
Plates, ship, bridge and tank, Scotland, for export	36.74	7 17 6
Beams, England	39.65	8 10 0
Beams, England, for export	37.32	8 0 0
Beams, Scotland	37.32	8 0 0
Beams, Scotland, for export	34.99	7 10 0
Sheets, black, 24 gage	51.32	11 0 0
Sheets, galvanized, 24 gage	86.30	18 10 0
Rails, 60 lbs. and over	38.49	8 5 0
Rails, 60 lbs. and over, for export	34.99	7 10 0
Tin plate, base box, 108 lbs.	4.78	1 0 6
Steel hoops	51.32	11 0 0
Steel hoops, for export	47.82	10 5 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	21.81	4 13 6
Hematite, West Coast, Mixed Numbers	23.33	5 0 0
Basic, Middlesbrough	19.24	4 2 6
No. 3 Foundry, Middlesbrough	21.46	4 12 0
No. 3 Foundry, Derby, Leicester, Nottingham	19.83	4 5 0
No. 3 Foundry, Northamptonshire	19.24	4 2 6
No. 3 Foundry, Staffordshire	19.83	4 5 0
No. 3 Foundry, Scotch	22.39	4 16 0
Ferromanganese, 76 to 80 per cent	69.98	15 0 0
Ferromanganese, 76 to 80 per cent, for export	65.31	14 0 0
COKE		
Yorkshire furnace	5.36	1 3 0
Yorkshire foundry	6.41	1 7 6

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	12.89	174,460
Foundry, No. 3, Oberhausen	11.43	156,595
Bessemer Stahleisen, Siegen	12.61	172,792
Foundry, No. 1, Oberhausen	11.44	156,665
Luxemburg Foundry	10.92	149,538
COKE		
Ruhr furnace	2.43	33,272
Ruhr foundry	2.53	34,630
SEMIFINISHED STEEL		
Billets	15.94	218,400
Sheet bars	17.36	237,800
Wire rods	16.91	231,700
FINISHED STEEL		
Standard rails	19.71	270,000
Merchant bars	19.71	270,000
Structural shapes	19.51	267,200
Ship plates	22.23	304,500
Medium plates, 3 to 5 millimeters	25.03	342,900
Sheets, below 3 millimeters	28.26	387,100
Tin plate	53.44	732,000
Plain wire	21.10	289,000
Bands and strips	23.44	321,100

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	21.76	320
Basic Bessemer, Lorraine	18.02	265
Foundry, Longwy, No. 3, sand-cast	17.34	255
Foundry, Longwy, No. 3, chill-cast	18.02	265
Ferromanganese, 76 to 80 per cent	76.16	1120
COKE		
French furnace	6.60	97
German furnace, f.o.b. frontier	6.60	97
French foundry	8.70	128
SEMIFINISHED STEEL		
Blooms	23.46	345
Billets	25.50	375
Sheet bars	27.20	400
FINISHED STEEL		
Standard rails	34.00	500
Merchant bars	32.64	480
Angles	31.28	460
Normal beams and profiles	31.28	460
Plates, ship and tank, 10 millimeters and thicker	42.84	630
Plates, bridge and tank, 5 to 10 millimeters	44.20	650
Sheets, black, 3 millimeters	46.92	690
Sheets, blue annealed, 2 millimeters	49.64	730
Shafting, cold-drawn, 40 to 60 millimeters	57.80	850
Bars, 2 per cent nickel steel	98.60	1450

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	17.43	280
Basic open-hearth, Belgian	17.43	280
Gray forge, Belgian	16.81	270
Foundry, No. 3, Belgian	18.68	300
Foundry, No. 3, Luxemburg	18.68	300
Foundry, No. 3, Lorraine	18.99	305
SEMIFINISHED STEEL		
Blooms	23.03	370
Billets	23.97	385
Sheet bars	25.21	405
Wire rods	35.79	575
FINISHED MATERIAL		
Standard rails	30.19	485
Merchant bars	28.64	460
Normal beams and profiles	24.59	395
Plates, 5 millimeters and thicker	30.50	490
Sheets, black, 3 millimeters	32.37	520
Sheets, galvanized, 1 millimeter	99.60	1600
Plain wire	45.13	725
Galvanized wire	60.69	975
Wire nails	33.93	545

All prices are f.o.b. furnace or works.

and the general view is that £17 5s ($80.04) will be the basis figure for some little time.

Considerable progress has been made in the recovery of markets for corrugated sheets lost during the war. For 11 months ending with November, 1922, the exports of such sheets were 465,319 tons, compared with 395,238 tons in the same period of 1920.

Various changes have been made in the tin plate mills, largely from the labor point of view. In one direction arrangements have been made for increased employment of helpers, facilitating increased output. The Welsh tin plate trade looks for a good deal of expansion, circumstances on the whole being favorable, although the international troubles in the Far East constitute a discouraging and ominous symptom. The price of tinplate ranges between £1 ($4.64) and £1 1s ($4.87) per box. On Jan. 1 tin plate bars were advanced from £7 7s 6d ($34.22) to £7 13s 9d ($35.67) subject to the usual rebate of 7 shillings 6 pence ($1.74).

The Staffordshire iron trade is still short of orders, but has benefited from speculative buying by warehousemen who find their stocks getting low. A few orders are coming through for best iron required for shipbuilding purposes.

The general expectation is that the great steel centers may look for a few years of expanding trade. Nearly all the railway works have increased their capacity. Railway orders are regarded as certain to arrive in good tonnages during the early months of the ye Makers of springs, buffers, tires, wheels, axles and castings are all getting busy.

The discouraging element continues to be the difficulties arising from the state of international exchanges. Among the changes to be anticipated are the increasing tendency of India to provide her own railway requisites, while Australia has made great advances in the same direction. It is fully recognized that very keen competition must be looked for in the supply railway requirements to countries like the Argentine and South Africa, which have in the past been largely depend ent on Great Britain for this class of material.

Will Build Refinery

London, Jan. 5.—According to a dispatch received in London an agreement has been completed between Siemens Schuckert G.m.b.H. and Siemens Halske of Berlin, the well-known German manu-

facturers of electrical and other heavy machinery, and the Furukawa copper syndicate of Kobe, Japan, for the erection of a copper refinery between Tokio and Yokohama. It is understood the proposed plant will cost $5,000,000 and that the copper will be electrolytically refined. The German interests in the contract are to be compensated by cash and 20 per cent of the common stock of the new refinery. The Furukawa syndicate will subscribe three quarters of the necessary cash capital and the remaining 25 per cent will be raised by selling securities to the public.

French Steel Production Decreasing

European Staff Special

Office of IRON TRADE REVIEW,
224 Rue de Rivoli,

Franc—$0.075

PARIS, Jan. 4.—Wide fluctuations in exchange rates for some time past are rendering export business uncertain. The iron and steel industry has also been disturbed by demands for higher wages, scarcity and rising price of coke as well as the fact that several of the most important comptoirs (selling syndicates) are on the point of dissolution. As to coke, the Société des Cokes de Hauts Fourneaux (S. C. O. F.), which fixes the price of furnace coke in France, has renewed its contract with the consumers of this product on practically the same basis as the old agreement, except for some modifications of the co-efficient applying to the base price for certain districts. The base price for January will be 97 francs ($7.30) per metric ton, or an increase of 2 francs ($0.15) over the price which has been prevailing since last September. It is expected that in February the price will be 110 francs ($8.25). Furthermore, no relief can be hoped for as to the coke shortage for at least two months. Deliveries of reparations coke amounted to 330,000 tons during the month of December or 80,000 short of the quantity fixed by the Reparations committee. France's actual needs amount to 700,000 tons per month. Belgian coke is now quoted 120 francs a ton and it is reported that this price will be quoted in French francs for export to France. English coke is very high on account of the rate of exchange.

The production of pig iron has increased during the month of December, but it is feared that the shortage of coke will soon result in several furnaces being blown out. No. 3 chillcast foundry pig is quoted around 255 francs ($19.10) per metric ton. Hematite pig prices vary according to regions; quotations range from 300 francs ($22.50) to 340 francs ($25.50).

Steel production is slowing down. The demand for open-hearth steel is growing to the detriment of basic bessemer. This has caused the difference in price between these two grades to increase until open hearth now costs about twenty francs ($1.50) per ton more than basic-bessemer. The Comptoir Sidérurgique will be dissolved on Jan. 1, due to the refusal of La Chiers to accept the conditions governing the allotment of tonnage. It is rumored that the Comptoir des Poutrelles is also on the point of breaking up. As to the Comptoir des Toles & Larges plats, this selling combine is encountering keen competition from independent companies, especially on ship plates. New plate mills recently completed in the North produced 2000 tons in December.

Makers of welded and seamless pipe have well filled order books and deliveries are becoming extended. The comptoir is said to be quoting 23 per cent of the French list on black gas tubes from ¾-inch to 2-inch on 100 ton lots, delivered Paris. This is practically the equivalent of 60 per cent off the American list,. but the high duty on this product eliminates foreign competition. The duty on American pipe ranges from 550 francs ($38.50) to 845 francs ($59.15) per metric ton, depending upon size and whether butt or lap weld. Paris jobbers are quoting 10 per cent off on small quantities, or an average of 1400 francs ($98) per metric ton. A few weeks ago galvanized pipe was selling at a 35 per cent increase over black, but several merchants are now asking 50 per cent, due to the recent advance in zinc.

German Steelmakers Reduce Prices

European Special Service

Mark—$0.00015

DÜSSELDORF, Germany, Jan. 4.—Heavy fluctuations in the exchange have had a depressing effect. Very little business is being transacted. Prices for the first time in three months are fairly stable but show a declining tendency. For delivery at the mills' convenience the Deutscher Stahlbund has officially announced a reduction on semifinished and finished steel amounting to about 8 per cent and most producers are accepting business on the lower basis of price.

Billets are quoted 218,400 marks ($33.60) per metric ton, sheet bars 237,800 marks ($36.50), and wire rods 231,700 marks ($35.50) per ton. Bars, shapes and plates are now quoted 270,000 to 304,500 marks per ton equivalent to 1.88c to 2.12c per pound. For prompt shipment, that is, under three months, premiums of 25 per cent and upwards are being obtained.

The mills are still fairly well supplied with unfilled orders and most producers are quoting three to four months shipment on new inquiries. Prices expressed in marks are now so high that inland trade is being appreciably checked, while on account of the uncertainties of the currency situation everybody is working on a strictly hand-to-mouth basis.

The fuel situation is much improved owing to increased production and for the first time in over a year the mines are having difficulty in getting rid of their inferior grades of coal. Fuel prices were increased by another 50 per cent on Jan. 1, along with railway rates, increased by another 100 per cent.

Labor is agitating for further increases in wages. The employers for the first time are showing a tendency to resist these demands.

Inland ores are firm and deliveries are better than for some time. Foreign ores are extremely plentiful and weak. The best Bilbao rubio is being freely offered at 23 shillings ($5.35) a ton c.i.f. Rotterdam.

Prepare for Heavy Tin Plate Demand

European Special Service

Sterling—$4.64

CARIDFF, South Wales, Jan. 4.—It is the opinion of prominent people in the South Wales tin plate trade that the first quarter of the new year will see a substantial demand from the Continent. The market is remarkably firm, the minimum prices being £1 to £1 0s 3d ($4.64 to $4.69) per standard box. The shortage of steel scrap, with a consequent increase in the price, is making some manufacturers anxious regarding tin bars, according to students of the market.

Portugal, Germany, Italy, Holland, and Denmark have been buying fairly large quantities of British tin plate, and the Far East and India are in the market for light weights. Wasters are firm, while ternes are steady, but quiet. With regard to the recent ar-

rangement between the tin plate merchants and the manufacturers, it is interesting to note that the merchants who originally pressed for 2 per cent commission, have accepted the makers' offer of 1 per cent.

Welsh tin plate bars were unchanged at £7 7s 6d ($34.10) per ton delivered up to the end of the year, and the price may be increased by 6 shilling 3 pence ($1.45), subject to the rebate of 7 shillings 6 pence ($1.75) per ton to tin plate works agreeing to maintain the association's minimum price on plates.

South America, Australia and South Africa are buying galvanized sheets in steady quantities, and business with India is hopeful. The price of 24 gage corrugated sheets in bundles is steady at £17 5s to £17 10s ($80.15 to $81.25) f.o.b.

Current prices of tin plate are as follows: Cokes, 14 x 20 inches, £1 to £1 0s 2d ($4.64 to $4.68); cokes, quarters, £1 0s 2d to £1 0s 11d ($4.68 to $4.85); cokes, 10 x 20 inches, £1 9s 2d to £1 9s 3d ($6.75 to $6.77); cokes 20 x 28 inches, £2 to £2 0s 3d ($9.27 to $9.33); ternes, 20 x 28 inches, £1 16s 6d to £1 17s ($8.35 to $8.48). The improving conditions in the iron and steel trades of South Wales are reflected in the export no less than in the import trade returns for the week ending Dec. 16. The increase in this week was greatest in the exports of tin plate, but it was also substantial in the exports of galvanized sheets, steel sheets, and miscellaneous goods. The total quantity of tin plate exported was 7791 tons, compared with 4940 tons the previous week. There was a slight setback in the shipments of black plates, which totaled 760 tons, compared with 1669 tons the previous week. The exports of galvanized sheets was 3851 tons.

Austrian Trade Suffers New Setback

European Special Service

Austrian Crown $0.000014

VIENNA, Jan. 4.—The Austrian iron and steel industry is now feeling the backlash of the inflation of the crown. Domestic and export business is considerably lighter and some works have dimissed a portion of their employes. Austrian engineering works are in many cases working with reduced forces for the first time in nearly two years. The problem of readjustment, which must be faced, is proving a difficult one for Austria as it has for other countries, although the difficulties on this score are much less serious than those which would result from the continuance of a policy of unbridled currency inflation. At present about 2½ per cent of the working population of Austria is unemployed.

In Czecho-Slovakia conditions are somewhat more favorable and the beneficial effects of a sound money policy are beginning to be apparent. Czech industry, on account of its low real costs of production, is now in a position to compete in Roumanian and other European markets both with Germany and Belgium. It is reported in these centers that the leading German and Belgian iron and steel export interests are working in harmony in eastern Europe so far as prices and competition are concerned. Czech exports of iron and steel in October amounted to 10,800 tons compared with 15,900 tons in October 1921.

Czech Crown $0.03

Scrap Buying Is Limited

(*Continued from Page* 204)

steel scrap in this district and as a result the market is softening. Most of them are well stocked ahead and are taking tonnage only to meet immediate needs. Buying is confined to machine shop turnings, busheling, and railroad malleable in the immediate Cleveland territory while some compressed and bundled sheets are being sold in the Mahoning valley. These grades alone are stronger, prices being marked up slightly under the influence of demand.

Prices Are Advancing

Philadelphia, Jan. 16.—Scrap dealers report that practically all the steel works are in the market at present. As a result prices are advancing and the market is exceptionally strong. Some indications of a scarcity of scrap are to be seen but this cannot be gaged accurately. Heavy melting steel is being quoted $2 higher now being $20 to $21, delivered eastern Pennsylvania. Despite the fact most eastern mills are negotiating for tonnage comparatively small orders are placed due to the difficulty of buyers and sellers to get together in the matter of price. However, present indications point to the placing of considerable tonnage shortly. The outlook is that prices will be considerably higher.

Mills Are Not in Market

Detroit, Jan. 16.—Although offers of scrap are more liberal and mills are not in the market at present prices there is a weaker tendency to the trade with no decided change in quotations. Dealers report mills stocks are fairly large in view of general requirements at this time. Hydraulic bundles are more freely offered than in recent weeks. Heavy melting steel also is plentiful, but dealers declare they are not taking on any large tonnages.

Prices Are Avancing

St. Louis, Jan. 16.—The market for scrap iron and steel continues to soar, changes in dealers' quotations reflecting advances of from 50 cents to $2.50 per ton. The strength is due to a number of causes, including an urgent demand from mills and foundries and scant offerings. Another factor in the situation is the high railroad freight rates and good export demand. The South, which usually contributes heavily to the scrap supplies of this center, is shipping scrap to the eastern states by water, thus cutting off tonnages which should be coming here and to Chicago. Western manufacturers, notably the Colorado Fuel & Iron Co., and the Kansas City Bolt & Nut Co., are absorbing large tonnages of western scrap.

Yard stocks are low with assortments incomplete. Heavy melting steel was marked up from $16.50 to $18 and shoveling steel from $16 to $17.50. Rails for rolling are advancing rapidly, due to a fair consumptive demand and outstanding short interest. Car wheels are scarce and in good demand and there is a strong call for cast grades.

Railroad offerings are moderate and everything sold has brought top prices. The 1800 tons of scrap marketed by the Missouri, Kansas & Texas was absorbed by a western Missouri melter. The Mobile & Ohio is offering 900 tons; the Wabash, 2900 tons; the Pennsylvania, southwestern division, 750 tons of No. 1 wrought; the Frisco, 1500 tons, and other southwestern lines, including the Missouri Pacific, small miscellaneous tonnages.

Orders are Small

Cincinnati, Jan. 16.—Developments in the local iron and steel scrap market during the past week were not important. The general run of business is in small lots, although here and there a large order has been received. The market, however, is firm. Sources which ordinarily are large consumers of scrap are showing little activity, although a few melters are manifesting more interest. Prices are firm. There is any number of small orders for prompt delivery. Probably the most active item on the list is low phosphorus scrap, but this activity is brought about because of the shortage of railroad specialties.

Prices Continue Upward

Boston, Jan. 16.—While prices in the scrap markets are strong, buying among consumers in this district has not as yet developed along expected lines. The American Steel & Wire Co., Worcester, Mass., has come into the market for heavy melting steel, and while the tonnage moved so far is not heavy, indications point to considerable buying by this interest and other nearby interests during the coming week. The price for heavy melting steel f.o.b. shipping point is firm at $16 with some dealers asking $17. Several Pittsburgh orders for steel are under negotiation. One of the largest consumers of stove plate has recently come into the market and is understood to have paid $17, delivered. Cast grades have not moved until very recently when delayed pig iron deliveries have caused some foundries to turn temporarily to scrap. Chemical borings are in strong demand with but small tonnages available.

Make Output Records in 1922

Building and Automobile Industries Reach New Levels of Activities—Shortages Which Prevailed Last Year Still Exist—Large Increase in Industrial Construction—Railroads Buying

BY JOHN W. HILL, FINANCIAL EDITOR

THE virtually complete picture of industrial activities in 1922 is now at hand. It reveals extensive general recovery in nearly all lines, and new high records in some. Despite the enormous increase in production since 1921, there is nowhere any hint of an over-supply of goods. The shortages which prevailed one year ago evidently remain unsatisfied still. Immense requirements exist for iron and steel, automobiles, building and railroad equipment.

Activities in these basic lines contributed largely to the business revival of the last 12 months. Continued expansion in them this year is confidently expected. That will mean greater prosperity on a broader scale. The industries making new high records were automobiles and building. Between them, these lines absorb 22.5 pounds of each 100 pounds of finished steel manufactured. For that reason their prosperity is highly important to the iron and steel industry.

Last year about $5,000,000,000 was spent in new building. Authorative estimates fix the probable 1923 expenditures at $6,000,000,000. The volume of construction involved in contracts awarded in 27 states in 1922 as reported by the F. W. Dodge Co., and pictured in the Business Trend, was 574,476,000 square feet. This territory includes about three-fourths of the total construction for the country. The total was 2.5 per cent over the previous peak of 560,196,000 square feet in 1919. It was 48 per cent over that of 1921.

Residential building comprised 55 per cent of the whole. It totaled 310,393,000 square feet. This was a gain of 52 per cent over 1921 and the largest housing total on record. Of unusual interest was the record of 65,549,000 square feet for industrial construction. Although this showing was about 40 per cent of the high level for 1918, it disclosed an increase of fully 83 per cent over the previous year. Such a sharp gain clearly reflects the revival of industry, and further industrial expansion should result in more building of factories and plants in 1923.

In the production of 2,527,000 passenger cars and trucks in 1922, the automobile industry broke its previous record of 2,205,000 in 1920. The year ended with a total registration in the United States of 12,357,000 cars. That is one car for every 8.7 persons. The replacement demand alone for automobiles in 1923 is estimated at 1,800,000 cars. Manufacturers are preparing for another record-breaking year and production schedules of many plants will be increased.

Buying by the railroads also promises to continue heavy this year. In 1922 the roads purchased 180,000 cars, or eight times as many as in 1921.

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Dollar Purchasing Power	May 4
112 Years of Prices	March 30

The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One Month ago	One year ago	1913
Business failures	540	396	396	719	350
Cash Ratio Fed. Res. system (per cent)	73.6	71.3	75.1	74.7	.....
Loan rate, 4-6 months, N. Y. (per cent)	4½-4¾	4½-4¾	4½-4¾	4¾-5	4¾-5
Aver. 20 Ind'l shares	$94.04	$94.24	$93.30	$97.52	$85.21
Aver. 20 Rail shares	$84.74	$85.68	$84.39	$74.79	$114.50
Aver. 40 bonds	$79.03	$79.25	$78.75	$77.05	$93.00
Car loadings (week ended Dec. 30)	711,200	834,591	945,219	528,556	*602,368
Bank debits 166 cities (000 omitted)	$9,898,095	$11,223,294	$9,243,928	$8,913,826	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	Jan. 15 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.66½	$4.64	$4.65	$4.22
Francs	19.3c	6.79½c	7.34c	7.57c	8.22c
Lira	19.3c	4.90c	5.10c	5.13c	4.43c
Marks	23.8c	0.0073c	0.009c	0.012c	0.53c

MONTHLY COMPARISION

	December	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$215,213,000	$248,366,000	$198,218,000	$71,450,000
Business failures:				
Number	1814	1737	2444	1336
Liabilities	$58,069,021	$40,265,297	$87,502,382	$22,723,000
Exports	†$383,000,000	$372,000,000	$274,000,000	$207,000,000
Excess of gold imports	†$3,274,561	$23,065,000	$39,530,367	*$630,716
Bureau of Labor Price Index	†156	154	141	100
Bradstreet's Price Index	148.2	149.1	123	100
Economist's British Price Index	4264	4285	4357	2717
Cost of Living Index	158.4	157.1	163.0	100.0
New incorporations	$813,901,000	$808,719,000	$618,572,000	$172,301,000
Railroad net earnings	†$78,860,000	$85,000,000	$65,884,000	$59,900,000

†November. *Monthly average export excess.

The Business Trend

January 18, 1923

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Business now undergoing some seasonal relaxation, but letdown is less pronounced than usual; employment larger and labor shortages expected to grow next spring; coal strike possible but hope for settlement grows; financial markets calm in spite of European events.

BUILDING CONSTRUCTION—Last year broke all records for new building; residential construction bulked largest, but feature of year was 83 per cent gain in industrial building.

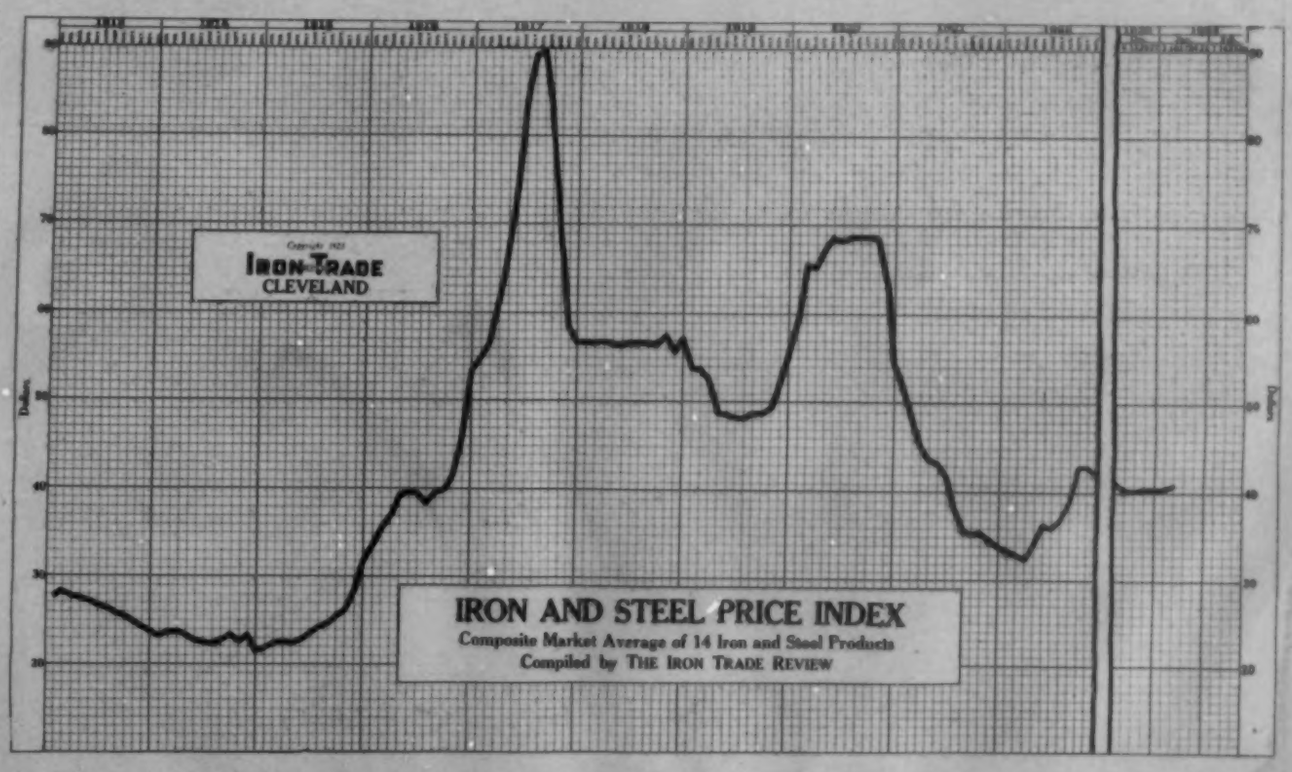
AUTOMOBILE PRODUCTION—New record for automobile output in 1922; total of 2,527,000 cars was 14 per cent over previous record of 2,205,000 cars in 1920; larger output planned for 1923.

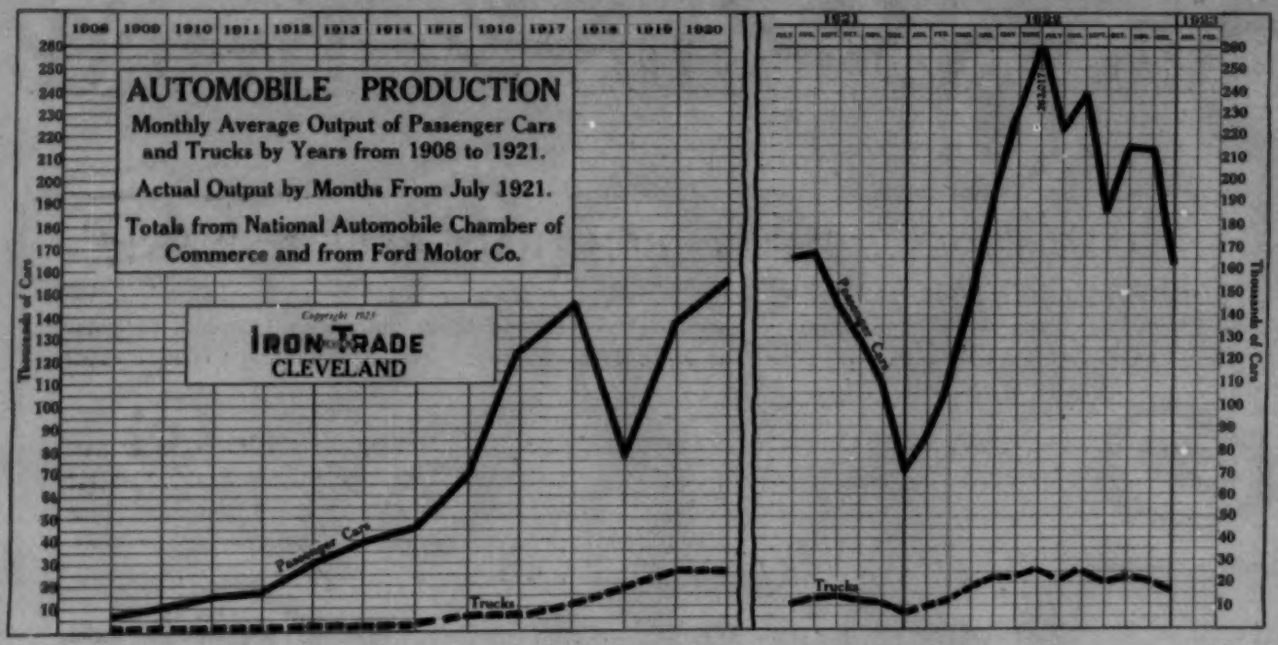
CAR ORDERS—Railroads purchased eight times more cars in 1922 than in previous year; December awards second largest of the year; roads still buying and outlook excellent.

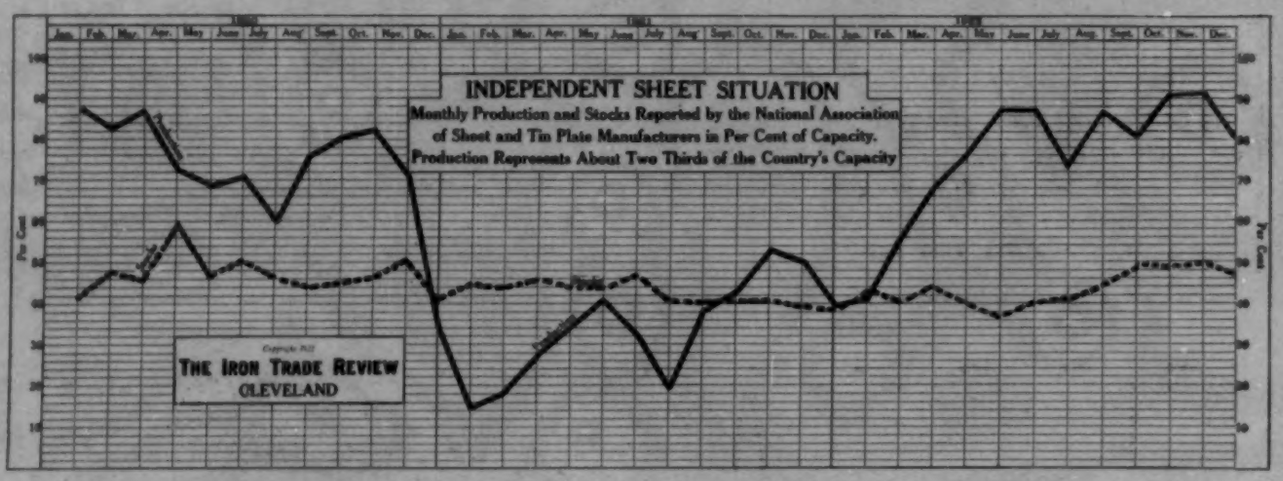
STEEL PRICES—Iron Trade Review index of 14 iron and steel prices gradually recovering following drop of 9 per cent from peak in September; now 55.9 per cent above 1913 level.

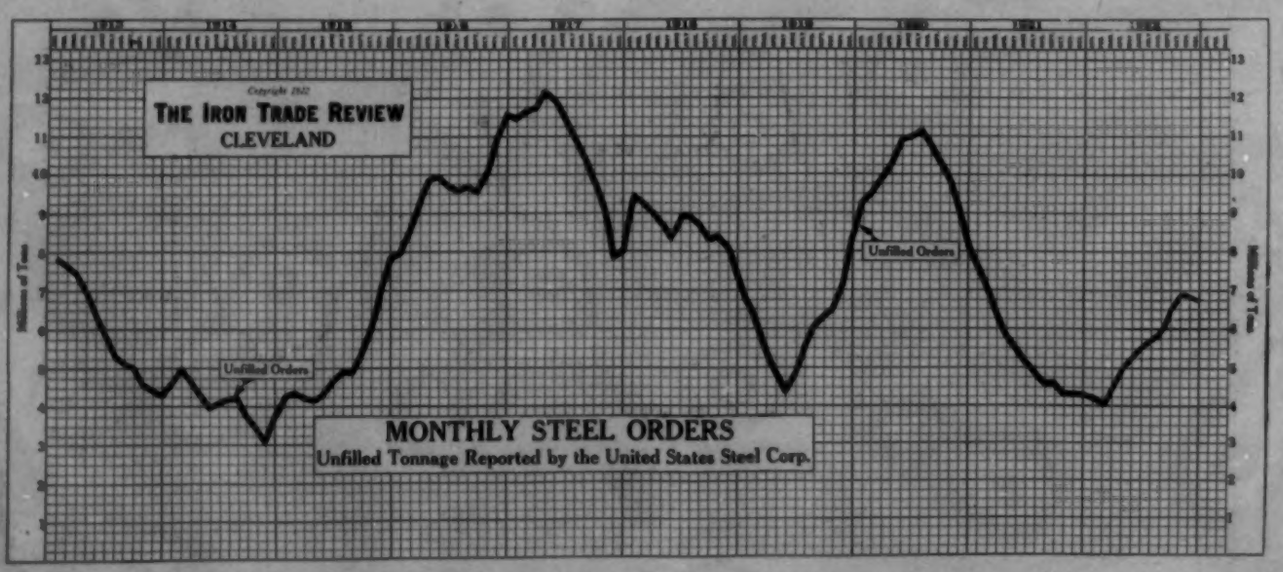
STEEL ORDERS—Unfilled orders of United Steel Corp. register second monthly decline; largely due to greatly increased shipments as traffic improves; total 58 per cent above year ago.

FOREIGN EXCHANGE—Strength of exchange rates, especially British sterling, convincing factor of encouragement for outlook in Europe; hope of some definite settlement growing.


IRON TRADE
CLEVELAND
IRON AND STEEL PRICE INDEX
Composite Market Average of 14 Iron and Steel Products
Compiled by THE IRON TRADE REVIEW


AUTOMOBILE PRODUCTION
Monthly Average Output of Passenger Cars and Trucks by Years from 1908 to 1921.
Actual Output by Months From July 1921.
Totals from National Automobile Chamber of Commerce and from Ford Motor Co.
Copyright 1921
IRON TRADE
CLEVELAND
Passenger Cars
Trucks
Thousands of Cars


INDEPENDENT SHEET SITUATION
Monthly Production and Stocks Reported by the National Association of Sheet and Tin Plate Manufacturers in Per Cent of Capacity.
Production Represents About Two Thirds of the Country's Capacity
Copyright 1922
THE IRON TRADE REVIEW
CLEVELAND
Per Cent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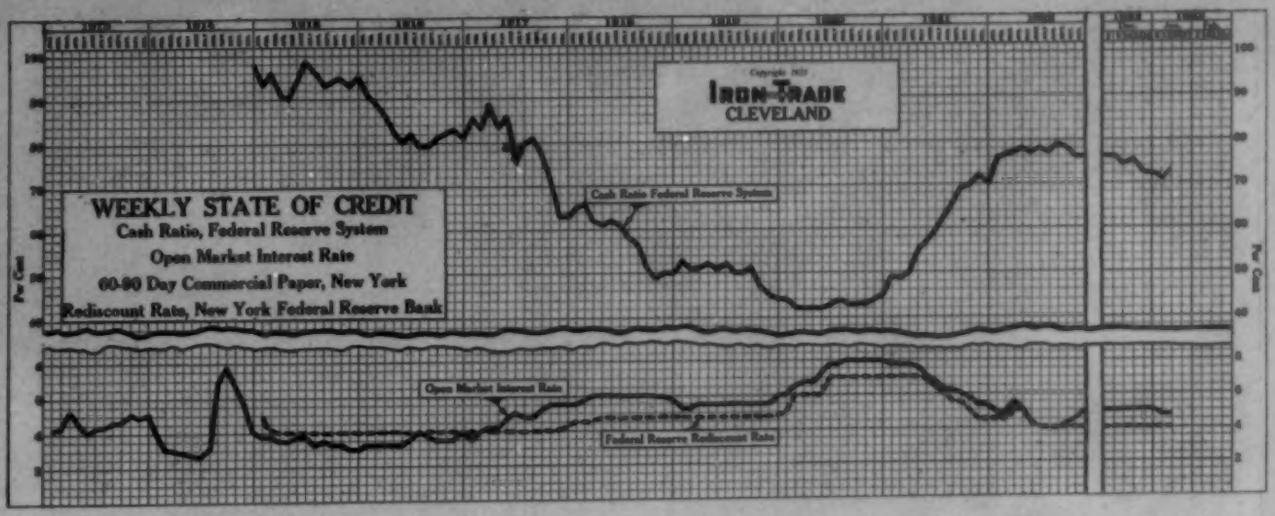
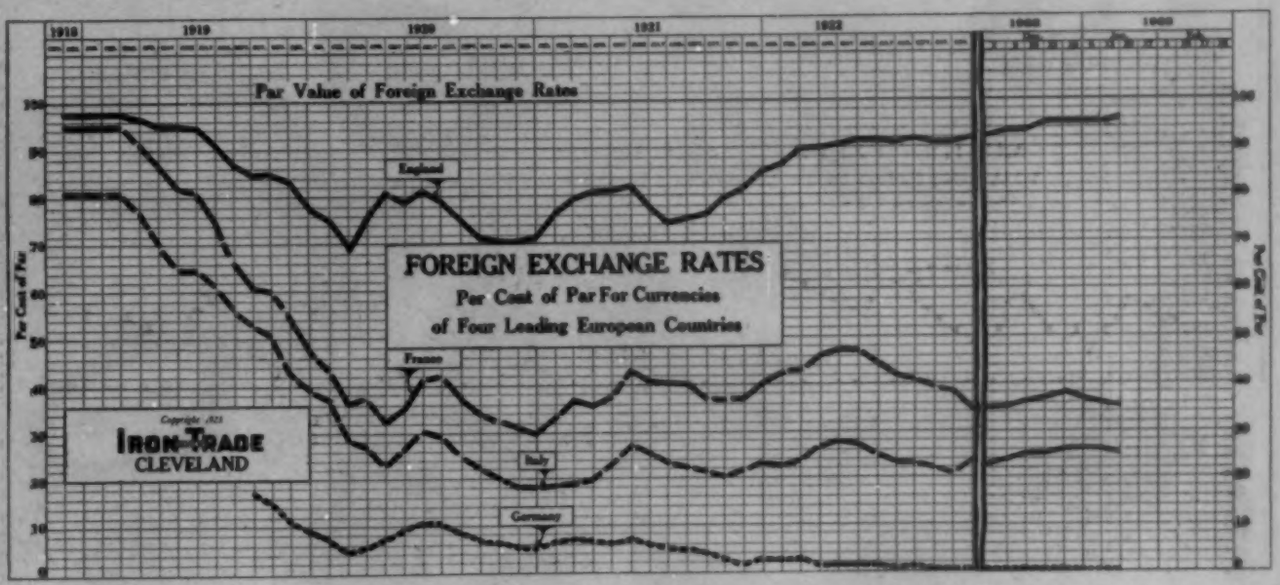
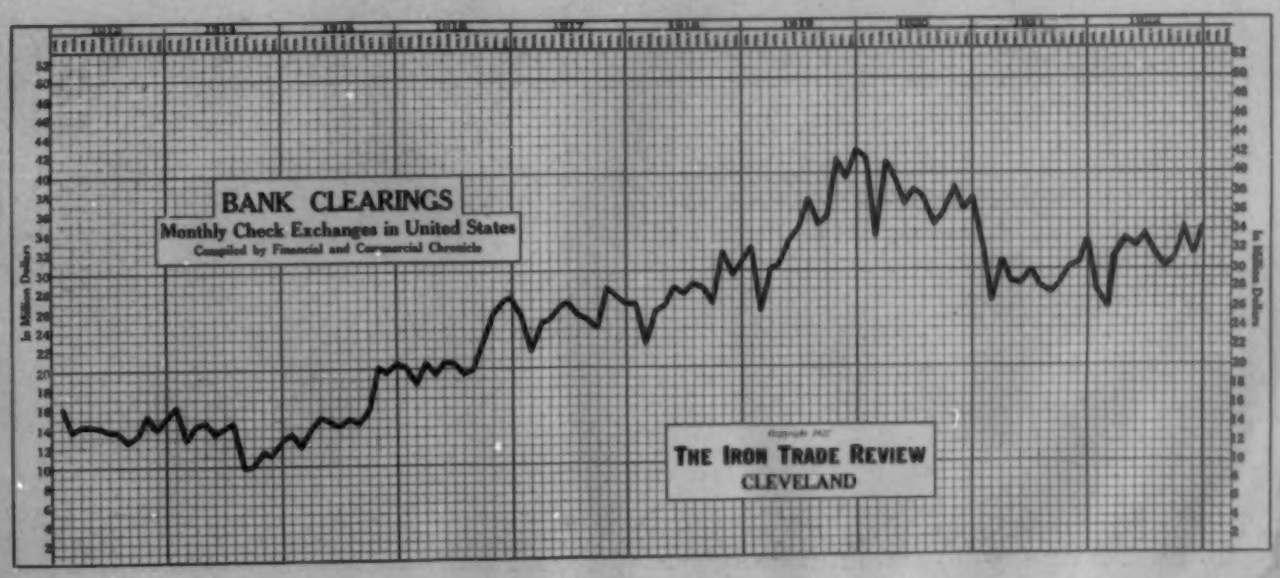
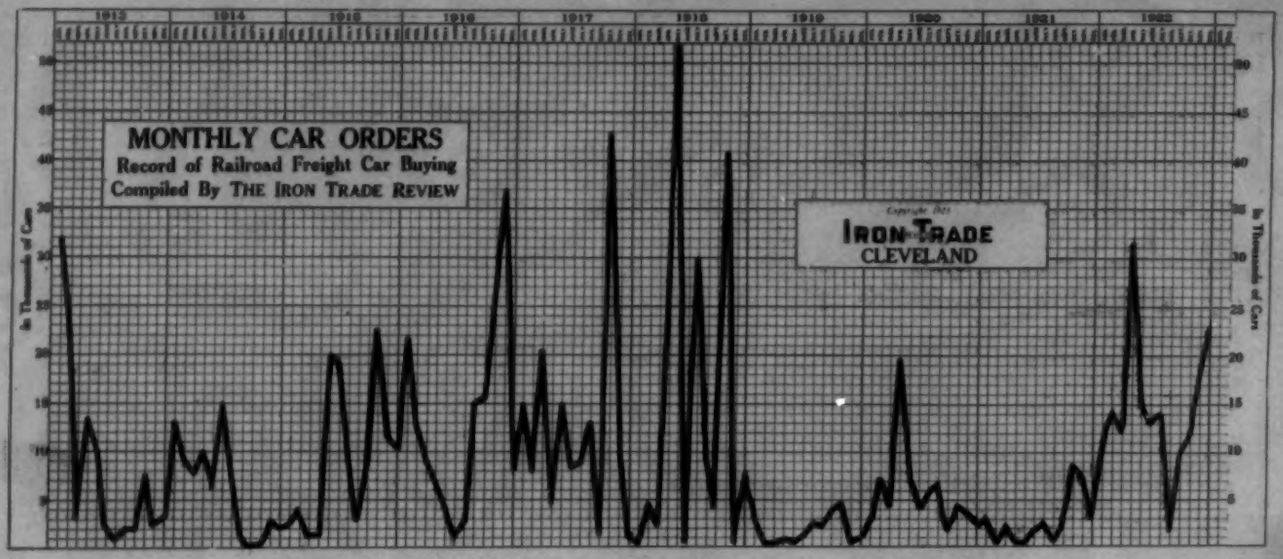
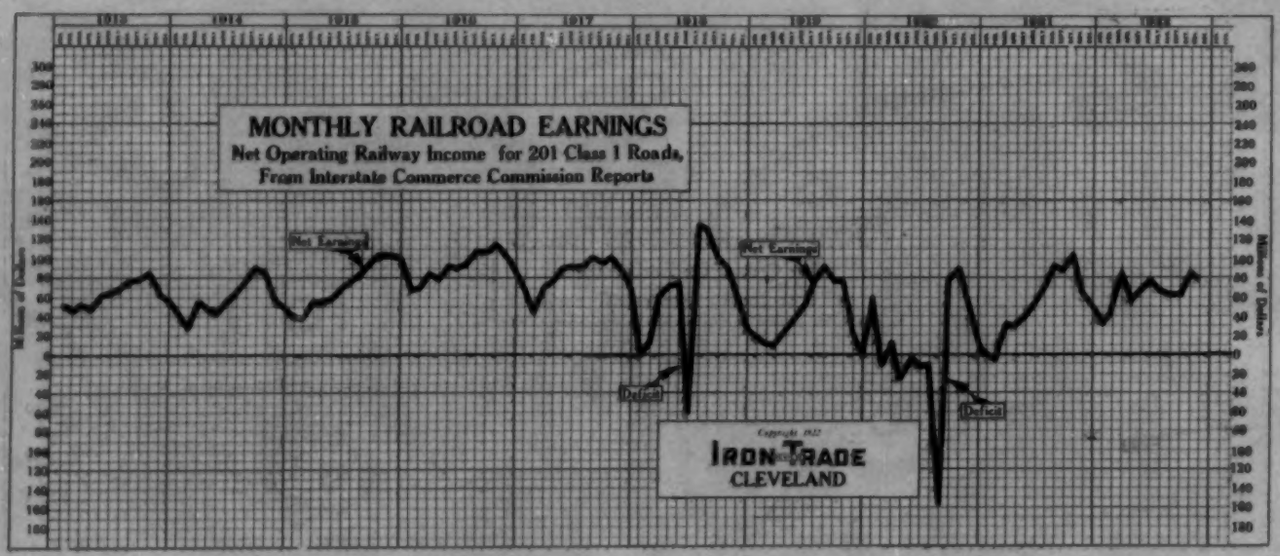
THE IRON TRADE REVIEW
CLEVELAND
Unfilled Orders
MONTHLY STEEL ORDERS
Unfilled Tonnage Reported by the United States Steel Corp.
Millions of Tons


WEEKLY STATE OF CREDIT
Cash Ratio, Federal Reserve System
Open Market Interest Rate
60-90 Day Commercial Paper, New York
Rediscount Rate, New York Federal Reserve Bank
IRON TRADE
CLEVELAND
Cash Ratio Federal Reserve System
Open Market Interest Rate
Federal Reserve Rediscount Rate
Per Cent


Par Value of Foreign Exchange Rates
FOREIGN EXCHANGE RATES
Per Cent of Par For Currencies
of Four Leading European Countries
England
France
Italy
Germany
IRON TRADE
CLEVELAND
Per Cent of Par


BANK CLEARINGS
Monthly Check Exchanges in United States
Compiled by Financial and Commercial Chronicle
THE IRON TRADE REVIEW
CLEVELAND
In Million Dollars


MONTHLY CAR ORDERS
Record of Railroad Freight Car Buying
Compiled By THE IRON TRADE REVIEW
IRON TRADE
CLEVELAND


MONTHLY RAILROAD EARNINGS
Net Operating Railway Income for 201 Class 1 Roads,
From Interstate Commerce Commission Reports
Net Earnings
Net Earnings
Deficit
Deficit
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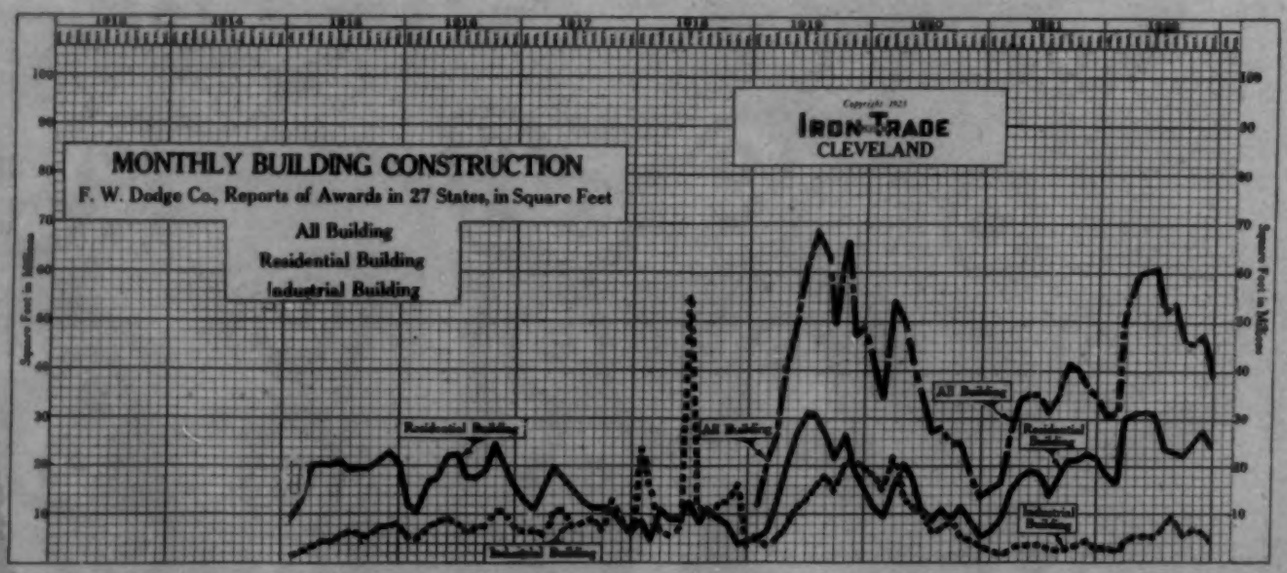
MONTHLY BUILDING CONSTRUCTION
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Enameling Sheets and Castings

Thorough Preparation of Material by Pickling or Sand Blasting, Improved Methods of Spraying and Muffle Furnaces for Burning on Enamel Contribute to Efficiency of New Enameling Plant

DEVELOPMENTS in the fabrication of iron and steel usually are accompanied by changes in the methods of finishing products made of these materials. This has been particularly true in the present metal industry, where the increasing use of pressed articles has imposed new problems upon the finishing departments.

In the early days of spun metal kitchenware, the comparative simplicity of enameling as then practiced by hand, made it a popular method of protecting the iron or steel from rust and corrosion. The gradual development of the power press, which permitted deep drawing and placed the process upon a mass production basis, made it necessary to modernize enameling equipment.

Methods Are Refined

Improvements in enameling during the past 10 years have been more in the line of adding refinements than of introducing any radical changes in procedure. Methods of applying the enamel have been improved, the furnaces have been made more efficient by improving combustion and introducing means of controlling temperatures within close limits, and drying apparatus has been redesigned so that the time element is an almost negligible factor. Material handling equipment has played an important part in placing enameling departments on a production basis.

Within the past few years the growth of the enameling industry has been remarkable. Stove parts, table tops, barber chairs, refrigerators, automobile engine manifolds, sanitary ware, kitchenware, waterheater jackets, and many other products of sheet steel and gray iron now are being enameled.

One of the most recently completed enameling plants in the country is that of the Wrought Iron Range Co., St. Louis. The equipment and methods employed in this new plant are especially representative of modern practice because sheet steel as well as castings are handled. The enameling department was designed and the equipment erected by the Ferro Enamel Supply Co., Cleveland.

The first step involves the preparation of the material for enameling. In the case of sheets, a pickling process is employed to remove all foreign matter and to insure a clean surface for the enamel. The sheets are placed in acid-proof metal baskets, shown in the center of Fig. 1, which are immersed in acids in the pickling tanks shown under the windows at the right of the illustration. Each of these tanks is 110 x 36 x 36 inches deep, and is constructed of 4-inch cy-

Fig. 1 (Left)—Pickling department, showing pickling tanks at the right, acid-resisting baskets in the center, and steam-heated dryer at the left. Steel sheets are prepared for enameling by pickling

Fig. 2 (Above)—Castings are cleaned prior to the enameling operation by sand blasting

Fig. 3—After being sprayed with enamel, castings and sheets are placed in this dry room, in which a temperature of 120 degrees Fahr. is maintained

Fig. 4—A close-up view of one of the furnaces, showing arrangement of work chamber

press. A 33 1/3 per cent solution of cold muriatic acid at 18 degrees Baume or a 6 per cent solution of hot sulphuric acid usually is employed for pickling. After leaving the acid tank, the work goes to a cold water tank for rinsing, then to a hot soda tank for neutralizing, and finally to the dryer which is shown at the left of Fig. 1.

The pickle baskets, which are 48 x 30 x 30 inches, are handled by an overhead conveying system equipped with air hoists for lowering and lifting them to and from the tanks. The dryer is equipped with a bed of rolls to facilitate the movement of the baskets.

Castings are prepared by sand blasting, the equipment, built by the Pangborn Corp., Hagerstown, Md., being shown in Fig. 2. In this type of sand blast chamber, manual handling of the abrasive is eliminated. Spent shot and disintegrated molding sand passes through the floor grating to an elevator which carries it to a separator. The clean shot is delivered for use, while the waste is discharged to a refuse bin. The room, which is clear of apparatus, is 7 feet 6 inches square. Fresh air is introduced around the base and the dust laden air is carried off through a ceiling hood.

After having been cleaned, the castings or sheets are taken to the spraying room, shown in Fig. 5, which is equipped with eight spraying booths. Each booth is 4 feet wide, 4 feet high and 30 inches deep, and has a tapered-back wall leading to an exhaust pipe. The eight booths are connected to a single exhaust system which is served by an exhaust fan. The enamel is kept in overhead pails, and flows through flexible tubes to air guns, where it

Fig. 5—Spraying booths, in which the work mounted on turntables, is sprayed by enamel issuing from air guns. The enamel is supplied from pails suspended above the booths. An exhaust system serves the battery of eight booths

is joined by currents of compressed air at a pressure of about 40 pounds per square inch. This is sufficient to force the enamel through the gun so that it emerges in a fine spray. The work revolves slowly on turntables in the booths. Each gun uses about 7½ cubic feet of air per minute.

The sprayed articles are taken to the dry room, shown in Fig. 3, in which a temperature of about 120 degrees Fahr. is maintained by forcing a current of air through a manifold of steam coils.

Perhaps the most important step of the process is that of burning on the enamel. At present six furnaces are employed for this purpose, but provision has been made for more when conditions require expansion. Fig. 8 is a front view of the furnaces; Fig. 4 gives a good idea of the muffle arrangement; and Fig. 7 shows the rear or firing side. The clay muffle tile was manufactured by the Massillon Refractories Co., Massillon, O., and the furnaces were built according to the design of the Ferro Enamel Supply Co. Four of the six furnaces were recently equipped with carborundum muffles and "V"-type bottoms.

Fig. 8—Charging side of the furnaces. The forks which convey the work into the work chambers are suspended from four-wheel carriages running on overhead tracks

Fig. 7—Firing side of the furnaces showing the sturdy construction of furnace walls

Fig. 6—A corner of the mill room showing mills in which enamel is ground and mixed

Each furnace is constructed somewhat on the principle of the early coal ranges. The heat rises from the grates in the rear to the space in the walls of the oven. The heat radiates through these walls into the work chamber, which is 52 inches wide and 10 feet deep.

The castings or sheets are subjected to a temperature between 1200 and 1700 degrees Fahr. for from two to seven minutes. Recording pyrometers are used to keep an accurate check on temperatures. The design makes it necessary to use a muffle tile having the greatest possible heat

conductivity that will not weaken at the high temperature. The flue space outside of the muffle wall is about 6 inches wide. The outer wall is lined with a 9-inch course of high grade firebrick which resists the flame action. A 9-inch course of insulating brick lies between the firebrick and the ordinary red brick which forms the outer section of the wall. The entire furnace is reinforced with stays and rods. Each pair of two furnaces is served by single 50-foot stack.

While in these furnaces, enameled castings are supported on racks formed of links made of a heat-resisting alloy of nickel and chromium. When sheet steel articles are being burned, the links are suspended crosswise in the furnace to support bars placed lengthwise. Forged points of a chromium nickel alloy are inserted in these bars to support the enameled ware. The use of these alloys does away with the excessive warping and scaling which attended the use of common iron or steel equipment in earlier furnaces. The spraying and burning process is repeated several times, according to the thickness of enamel required.

One of the unusual features in connection with the operation of these furnaces is the method of charging. Each unit is equipped with a fork which runs on an overhead track as shown in Fig. 8. The carriage has four 26-inch wheels, each with roller bearings. The fork is suspended from the carriage, and as the wheels move forward, the fork blades are projected into the furnace. After the fork is in the furnace, the blades are lowered 6 inches, which alloys the links or points supporting the work to rest on the muffle. This frees the fork, and it can be withdrawn without disturbing the work.

The mill room, shown in Fig. 6, is equipped with two 500-pound, two 150-pound and one 85-pound mills. The enamel glass is placed in these mills with clay, water, oxides, etc., and ground for several hours until the material becomes a creamy fluid, ready for dipping or spraying.

Iron and Steel Output in Canada Declines

Pig iron produced in Canada during November totaled 34,289 gross tons and showed a 7 per cent drop from the 36,888 tons made in October. This output was made up of 26,156 tons of basic and 8133 tons foundry iron. In addition, ferroalloys totaled 1502 tons. The basic iron was all made for the use of the maker and the foundry iron was made for sale. On the last day of the month four blast furnaces were in operation and 16 were idle. During 1922 the production of Canadian pig iron totaled 347,166 tons as against 554,437 tons during the corresponding period of 1921, the loss being 27,271 tons or 37.4 per cent.

Steel ingots and castings during November totaled 51,418 gross tons and was a decrease of 1217 tons from the October output of 52,735 tons. This tonnage was made up of 48,821 tons of basic open-hearth steel ingots, 1912 tons of basic open-hearth steel castings, 263 tons of bessemer steel castings and 1122 tons of electric steel castings. The cumulative production of ingots during 1922 aggregated 419,657 tons and of castings, 19,331 tons. The total of both for the first 11 months of the year was 438,988 tons, while during the corresponding period of 1921 the output was 624,831 tons, the loss being 185,843 tons or 29.7 per cent.

Production of Manganese Ore Shows Gains

Output of manganese ore, 35 per cent or more manganese, in 1922 is estimated at 13,500 gross tons valued at $457,000 compared with 13,531 tons valued at $495,097 in 1921, by the federal geological survey. Montana accounted for more than 10,000 tons of the 1922 output.

Production of manganese ore, 10 to 35 per cent manganese, was 352,000 tons in 1922 and 8439 in 1921. The value of the 1922 output is estimated at $1,232,000, while that of 1921 was $42,755. About 308,000 tons of the ore of this grade shipped in 1922 was mined in Minnesota.

Manganese ore of 5 to 10 per cent content to the extent of 251,000 tons was mined in 1922, compared with 62,670 tons in 1921. The 1922 valuation is placed at $630,000; the 1921 one at $147,576. Minnesota is credited with 248,000 tons of the 251,0000 in 1922.

Imports of manganese ore for the year up to Sept. 21, when the new tariff took effect, totaled $266,969 tons valued at $2,324,989. In stating that the new tariff should not greatly effect domestic production the geological survey observes:

"The new tariff act, which became effective Sept. 21, provides for a duty of $8 a ton on ore containing 40 per cent of manganese, $9 a ton on ore containing 45 per cent of manganese, $10 a ton on ore containing 50 per cent of manganese, and so on. Manganese should therefore bring an average price on the eastern seaboard amounting to the present average price of foreign ore plus about $9 a ton. The new tariff has not yet greatly affected the domestic manganese market, for even under its provisions not many domestic mines can be operated at a good profit; but the owners of mines that have heretofore been worked profitably have shown a renewal of interest in the industry, and some of the mines that are already developed and that yield ore of high grade will probably be re-opened."

Questions Advantages of Titanium Steels

"The use of titanium as an alloying element for steel is much shrouded in secrecy," states the federal bureau of mines. "Carbon-free ferrotitanium has been employed in Europe for making an electric steel containing 5 to 7 per cent titanium. Rumors of the use of titanium alloy steels for armorplate have been circulated, but so far as is known to the bureau, no merit has been found in the addition of titanium to steel as an alloying element, and experiments with steels containing 0.1 to 1.0 per cent titanium have shown no special advantages. A more interpretative investigation than any so far carried out, is required to distinguish more clearly the merits of titanium alloy steels, and it must be assumed now, pending exact proof to the contrary, that these steels are of no particular value, or at least yield no advantages not provided by other steels. It is rather difficult to get the carbon-free ferrotitanium to alloy with steel without much loss of titanium, and this fact coupled with the high price of the carbon-free alloy has tended to discourage experimentation by steelmakers in this direction. It is possible, however, that if the cost were less, some combination of titanium, either alone or with other metals, might produce valuable steels for some purposes, and experiments need to be carried out. Titanium increases the hardness of steel, and experiments on titanium steels have been made by Guillet, Braun, and Lamort. It has been shown recently that fair recoveries may be expected with carbon-free ferrotitanium, provided the alloy is added at the end of the heat and the steel is very hot. Complex iron-chromium-titanium alloys have been patented for use in making chromium steels—for example, 55 to 75 per cent chromium, 5 per cent titanium, 5 to 10 per cent carbon, and 34 to 10 per cent iron."

Producing Iron and Steel in China

Outputs of Both Pig Iron and Finished Rolled Products Are Far Below the Available Capacity—Inferior Grades of Raw Material and High Operating Costs Are Responsible—Foreign Goods Sell at Lower Prices

BY LANSING W. HOYT

LITTLE information is available in America covering blast furnace and mill practice in China and Manchuria and that which is available is to a large extent too partial to China. Considerable publicity has been given the wonderful resources supposed to be at the disposal of Japan in Manchuria and other parts of China through the enterprise of her iron and steel engineers. Doubtless on paper the millions of tons of iron ore now owned by the Japanese in Manchuria looks impressive from a geological standpoint, but from a blast furnace operation standpoint, Manchurian ore acts unsatisfactorily. It is too low in iron content containing about 30 per cent iron, and will have to be concentrated before successful furnace practice is possible. This concentration is practicable but the additional cost may prove too excessive. Manchurian coke is high in ash, containing about 16 per cent, has about 10 per cent moisture and is none too good for the work in hand.

For purposes of discussion, it is convenient to separate China's iron plants into three distinct groups, namely, the Hankow district, the Peking or Chihli district, and the Mukden or Manchuria district. These three groups embrace every blast furnace and mill thus far erected in China. At present there are 12 completed blast furnaces, varying in age from 30 years to a few months. Their rated individual daily outputs range from 100 to 450 tons of pig iron. Three are of 100 tons, two of 130 tons, two of 200 tons, three of 250 tons and two of 450 tons, making a total rated output of 2610 tons per day.

Much Capacity Idle

If Chinese and Japanese blast furnaces in China lived up to their rated capacity, a total of about 900,000 tons of pig iron would be produced yearly. In August, 1922, however, but 500 tons of pig iron was being cast daily, this being a yearly rate of only 180,000 tons. This shrinkage in production is not due entirely to the present depression in business. Only four furnaces are out of blast owing to the 1921 drop in price of pig iron and these, idle through lack of funds, have a total rated capacity of 220,000 tons per year.

Two other furnaces, with a capacity of 73,000 tons yearly, are enjoying a forced retirement because of their obsolete design. Adding these tonnages together, it is evident that about 300,000 tons of iron making capacity is idle due to causes beyond the control of the management or to the present economic depression.

Deducting this total from the 900,000 tons of rated capacity for the whole of China and Manchuria, we find that 600,000 tons of iron should now be the annual output of the entire country. But on Aug. 15, 1922, the yearly rate was roughly only 200,000 tons, leaving a 400,000-ton deficit which must be chargeable to poor design, faulty construction, and inefficient blast furnace practice and management. It must be remembered that in China no foreign supervision is being employed except Japanese, and it must also be realized that while the Chinese are attempting to operate the two new 450-ton furnaces at Tayeh, the furnaces are of Japanese design and it is doubtful if enough essential consideration to profitable manufacture has been given to certain phases of the operation.

There are two companies owning blast furnaces in the Hankow district. The leading interest is the Han-Yeh-Ping Iron & Coal Co., Ltd., and has by far the largest plant in China. This company owns six blast furnaces, a rail mill, plate mill and bar mills. The other company, the Yangtse Engineering Co., owns but one 100-ton blast furnace, besides its engineering works, or bridge shop. The furnace is now out of blast, having shut down about January, 1922. The Han-Yeh-Ping Co., likewise, is the only company in China which has ever manufactured rolled steel products. This company derives its name from a combination of certain syllables in the names of its subsidiary organizations, namely, the Hanyang Iron & Steel Works, Tayeh Iron Mines, Pinghsiang Colliery and the Yanghsing, Changlai, and Changnien Manganese Ore Mines. The Hanyang Iron & Steel Works, founded in 1890 by a Viceroy of Hupeh Province, gets its iron ore from a place called Tayeh, 65 miles downstream from Hankow. In 1907 the Hanyang works and the Tayeh mines were amalgamated with the Pinghsiang Colliery into the present parent company.

Location of Steel Works

The Hanyang Iron & Steel Works are located at the confluence of the Han and Yantse rivers and are within a mile of Hankow proper. Hankow is the largest city in central China, having a population of 1,300,000. It is a terminus of the Peking-Hankow Railway and when the other railways are completed will be the terminal for both the Canton-Hankow Railway and the Hankow-Chungking Line. Hankow is about 700 miles from the sea.

The site of the plant appears to be ideal, when first seen, but even a cursory inspection soon develops the

Chinese Industry Lags

THIS article, presenting an interesting picture of the iron and steel situation in China, probably represents one of the most careful and reliable studies of the Chinese industry ever presented by the technical press. Using American practice as a standard, the reader will be impressed with the slow advancement which has been made by this nation of the Far East. The causes for this are both natural and economic. Raw materials which are available are not of the best and operating costs are high. In addition, much of the equipment is now obsolete. These conditions coupled with the recent business depression have forced much of the capacity into idleness. Foreign material can be delivered to China and sold considerably below the cost of producing the goods at home. While these conditions obtain, little can be expected from the Chinese industry. This report has been released by the bureau of foreign and domestic commerce, Washington. The author, Lansing W. Hoyt, is trade commissioner, Shanghai, China. Another article by Mr. Hoyt will appear in an early issue of IRON TRADE REVIEW.

fact that the area of 110 acres is too cramped for efficient operation. The only advantage the location possesses is good water transportation, but this advantage also obtains in other areas near Hankow which would have been much more suitable to present-day furnace and mill practice. It is said that old Viceroy Chang, the founder, insisted on the plant being near enough to his palace so that he could see the furnace gases by day and the cast house flare by night. The fact that the site chosen was low and almost marshy caused considerable trouble later on when additional plants necessitated heavier foundations. The ground water always present also has been a constant annoyance at the open-hearth plant where trouble is caused frequently by damp checker chambers.

On the Yangtse river front, a modern ore bridge with two grabs of English design handles the Tayeh ore and limestone which is delivered close to the wharf during the high water season, but which must be unloaded from a point 130 feet further out during low water. This fall in water level necessitated the building of cantilevers capable of sustaining large grabs working at times almost 150 feet from the face of the wall. When the grabs are working at the extreme radius an upward pull of 120 tons is exerted on the four rear columns. The overturning movement is counteracted by a 500-ton block of concrete. The unloader consists of two transporters, 50 feet between centers. Each transporter is fitted with a traveling carriage from which is suspended a crane capable of revolving 360 degrees while operating a grab weighing seven tons empty and 11 tons full. The total weight of each grab and its transport is 43 tons. Owing to the high lift of 75 feet at times and to the 650 feet carry to the bunkers and back, the rate of unloading is curtailed somewhat. While the bridge is rated at 100 tons an hour per grab, Chinese operators generally unload at the rate of about 70 tons for each grab. Even this rate works out much cheaper than coolie labor and insures a steady handling of material under all conditions of weather.

Coolie Labor Is Utilized

No provision, other than coolie labor, has been made to handle the coke which arrives from Wuchang in lighters on the Han river side. When operating to capacity the Hanyang plant handles at its two wharfs about 3000 tons of raw materials daily. All these raw materials come from the other side of the river. The ore and stone come from Tayeh 65 miles down stream, and the coke from Pinghsiang, 310 miles south by rail from Wuchang, the city opposite Hankow on the Yangtse. This means that all the coke must be rehandled at the river, a rather expensive proposition even with cheap labor. The ore and stone being transported by water direct from the loading wharf on the Yangtse, which point is only 15 miles from the Tayeh mines, comes to the plant under comparatively low freight and labor charges. The ore docks at the Hanyang works are operated under the shipping department which also controls the movements of the company's 120 lighters and 21 tugs. The handling of the raw materials as far as the blast furnace stock house, is done as well as could be expected. From a raw material standpoint, the coolies employed on coke handling are the only source of annoyance to an American eye.

Costs of raw material at the Hanyang works have increased greatly during the last six months. Figures during the second quarter of 1922 are given as follows:

	Gold dollars per ton
Pinghsiang coke at stockhouse	14.00
Tayeh iron ore at stockhouse	2.82
Tayeh limestone at stockhouse	2.30
Native iron scrap at stockhouse	2.00

From the above it is seen that cheap pig iron is out of the question at Hanyang even if furnace operation itself were perfect. Burden sheets of Hanyang blast furnaces show that on an average 3000 pounds of coke, 900 pounds of limestone and 3500 pounds of iron ore are required to make one ton of pig iron. Costs sheets show that the cost of pig iron is distributed in the following proportion:

Coke, 55 per cent; iron ore, 13.5 per cent; limestone and manganese ore, 4.5 per cent; power, interest, labor, overhead, etc. 27 per cent. With coke at $14.00 gold per ton and a consumption of 1 1/3 tons per ton of pig iron made, we get a coke cost in gold dollars of 18.60. If the coke cost is 55 per cent of the total cost of a ton of iron at the cast house, the cost of pig iron is therefore gold $33.90. Labor costs entering into this figure do not exceed 2 per cent or about 67 cents gold per ton. The balance of 25 per cent takes care of power, depreciation, interest charges and all overhead. Interest charges add $4 gold to the cost of pig at Hanyang.

Furnaces No. 1 and No. 2 of British type were erected about 30 years ago and were each producing 100 tons a day, but they were blown out in 1915. They are nearly obsolete now and it is almost certain that they will not make pig iron again. They are brick stacks with steel band reinforcing around the bosh, having no metal shell. Four stoves and one gas cleaner serve each furnace. The blast is supplied by one horizontal compound blower and three vertical two-cylinder blowers. Excess furnace gases fire 14 boilers.

Furnaces No. 3 and No. 4 were built by Germans and were blown in during 1915. They are of 250 tons daily capacity and from an operating standpoint work fairly well. These furnaces are hand filled, the buggies containing raw materials being loaded below and hoisted by elevators to the charging floor. Blast pressure is about 6 pounds per square inch and is supplied by three turbo-blowers, one of which is used as a spare. They are capable of delivering 30,000 cubic feet of air per minute at a pressure of 9 pounds, but under local conditions 6 pounds is sufficient. Boilers fired by excess furnace gas furnish the steam.

These furnaces are the only ones now in blast in the entire Hankow district, but even they are being operated at a loss. The Tayeh mines are well situated and the ore contains about 60 per cent iron. With 40,000,000 tons in sight, these mines alone are good security. The ore is the best in China and is the equal of most ores in America. The analysis of the ore is as follows:

	Per cent
Iron	59.45
Manganese	0.63
Sulphur	119.019
Phosphorus	0.109
Aluminum oxide	1.05
Copper	0.292
Silicon oxide	9.16

Coal from which coke is made shows an analysis as follows:

	Per cent
Fixed carbon	54.118
Gaseous matter	23.490
Combined water	1.392
Ash	21.000

It is evident that the coke will contain considerable ash and this is the case, the average ash content being about 18 per cent. The moisture in the coke also is high being about 10 per cent or even more. With coke containing 10 per cent moisture and 18 per cent ash, it is readily seen why, despite a good ore, 3000 pounds of coke is required to make a ton of pig iron. An additional drawback to efficient blast furnace practice at Hankow is the moisture in the air. Hankow is one of the wettest spots in the Far East this being especially true during the summer months. This highly saturated air consumes considerable coke, although no exact figures are available as to how much.

The pig iron made at the Hanyang works is a good product. Basic pig

iron and No. 1 foundry iron have the following analyses:

	Basic per cent	No. 1 Foundry per cent
Silicon	1.00	2.75
Manganese	1.25	0.50
Phosphorus	0.150	0.150
Sulphur	0.03	0.03

Slag from the furnaces is used for fill but a brickmaking plant consumes a fair amount. Bricks made at Hanyang are sold locally for building purposes. The pumphouse supplying cooling water to the bosh plates, tuyere coolers and cast house contains five motor-driven turbine pumps and one steam pump. This is an ample supply because under normal operation three pumps only are required.

At the present time, all the pig iron produced is cast in sand pig beds in the cast house adjoining the furnaces. Six casts are made per day from each furnace. The pig bed is broken up by coolies and the pigs carried out of the cast house when cool to cars which transport them to the loading wharf. When the open-hearth furnaces were operating, some of the molten pig iron was cast into hot metal ladles, which in turn were emptied into the 150-ton mixer at the open hearth.

Pig iron production at the Hanyang furnaces Nos. 3 and 4 from 1915 to 1921 is as follows:

	Gross tons
1915	136,531
1916	149,929
1917	149,664
1918	139,152
1919	166,096
1920	125,305
1921	126,496

The above figures show that while these furnaces are rated at 250 tons, actual production was only about 200 tons. Time out for relining and banking reduced production. Due to good ore, fair coke, and lack of innovations in construction, these furnaces from a metallurgical standpoint operate better than most Chinese furnaces.

The steelmaking plant at Hanyang is the only one in China and consists of seven 30-ton basic open-hearth furnaces and one 150-ton mixer. There is nothing unusual about the furnace layout. These furnaces were built about 15 years ago to furnish steel ingots for the blooming mill installed at the same time. They would be considered too small for efficient operation in America, but there are numerous furnaces similar to these in operation in England and Europe. The checker chambers and air and gas flues are too far underground, moisture being prevalent on this account. The slag chambers are not large enough to protect the checker-brick from slag deposits efficiently. The furnaces proper are not long enough to allow complete combustion before the gases reach the outgoing ports. This causes the ports to wear back much quicker than would otherwise be the case, and the gas flow is more difficult to direct due to this erosion. After the furnaces have been operated awhile the gases attack the roof too readily with a consequent shortage of life for the furnace. A run of 200 heats on a roof is considered excellent. This practice adds to the cost as silica brick was expensive in China up to the time those furnaces shut down. Japanese furnace brick are used, the prices being as follows:

	Gold cents
Silica brick, each	20
Magnesite brick, each	80
Chrome brick, each	40
Fire clay, per ton	$25.00

Little Scrap Is Used

Owing to the scarcity of cheap steel scrap in China, the open hearths at Hanyang are operated on about an 80 per cent pig iron basis. Except in case of emergency, practically the only scrap used is that recovered from the pit and rolling mills. Being so highly "pigged up," the furnaces operate much slower, averaging about two 30-ton heats per day. Figures during the last six years show the following ingot tonnage produced:

	Gross tons
1916	43,104
1917	60,933
1918	25,146
1919 (Japan commandeered pig iron)	4,850
1920	50,912
1921	46,800

Finished steel tonnage mostly rails during the period 1916-1921 was as follows:

	Gross tons
1916 (cold stock rolled)	45,043
1917	42,651
1918 (cold heats charged)	26,994
1919 (pig iron sent to Japan)	3,684
1920	38,260
1921	35,100

Under prevailing operating conditions the Hanyang plant is like a megaphone, with the blast furnaces at the big end. The furnaces provide more pig iron than the open hearths need; the open-hearth capacity is larger than the mill capacity; and finally the mills produce more steel products than can be sold profitably under prevailing prices. Of course, pig iron always can be sold to Japan at a price, but it seems poor foresight to operate seven 30-ton open hearths spasmodically when two 75-ton furnaces could supply enough steel, allowing time for periodic relining. This would save considerable gas coal and much labor per month, for instead of 18 gas producers, six modern producers would be sufficient.

The furnace floor of the open hearth is served by two 35-ton electric cranes and the charging box is handled by a charging machine. On the pit side of the building are two 50-ton ladle cranes, a pouring platform and a hydraulic stripper. The steel ingots are cast in molds set on turtle-back cars and when stripped are brought to the blooming mill soaking pits by locomotives. A charging crane places them in the heating pits. When set and reheated the ingots are drawn and sent to the blooming mill. There is nothing unusual in the mill equipment except that it would be considered obsolete in America, though perhaps not in Europe.

Although the 40-inch blooming mill and the 28-inch rail mill, used also as a structural mill, were installed only about 15 years ago, no one at the time seemed to have known of the continuous mill which in 1907 was quite common in the United States. The Hanyang blooming mill can "knock down" a four-rail ingot into a bloom in good time, but when the hydraulic shears have cut the bloom into two railers, the delay is noticeable. A four-rail bloom, 85 pounds to a rail, is the easiest one to roll in American mills and tonnage piles up rapidly, but in the two-high mill at the Hanyang works, the fact that the bloom must be cut in two is a serious handicap. Costs start to rise at the 28-inch mill because both the first and second roughing as well as the finishing rolls are all in line, that is, in one train and naturally the second two railers cannot enter the first roughing rolls until after the first two railer enters the finishing pass. It would be slow enough even if the four-rail bloom could be rolled direct from the blooming mill.

Owing to lack of room this is impossible and all blooms therefore are cut and reheated before reaching the first roughing rolls. When working to capacity under these conditions, it is not surprising that but 120 tons of rails are rolled per day. The 28-inch mill is driven by a 6500-horsepower engine. Another engine of 12,500 horsepower can be connected to the other end of the roll train when desired. The housings, couplings, pinions, rolls, etc., are of the type required in a continuous mill, but the output however, is but 25 per cent of that possible in a continuous mill.

As the two railers leave the finishing pass they are rollered along to the hot saws, one electric and one steam where they are cut, and after going through the cambering machine reach the hot beds. The straightening presses, drill presses, and milling machines easily handle the product arriving from the hot beds. Structural shapes up to 12 x 6-inch beams can

also be rolled on the 28-inch rail mill.

In line with the blooming mill is the plate mill roll train driven by a 2500-horsepower engine. A roughing and a finishing set, two high, constitute this unit. A plate straightener set is in line with the finishing mill and is motor driven. This plate mill turns out plates from 2 to 7 feet wide and from 1 to ¼ inch thick.

A three-high, 16-inch bar mill is used for rolling, fish-plate, bars, etc. A light rail mill rolls from time to time rails under 30 pounds per yard. Nineteen coal-fired boilers supply steam to the big mill and eight additional boilers furnish power for the lighter mills.

British Standards Observed

The products turned out by these mills are up to British standard specifications. The rails conform to a severe drop test, which is practically the same as the British standard. One piece of rail 6 feet long, taken from every 50 tons of rails manufactured, is placed on iron bearings 3 feet 6 inches apart in the clear, and equidistant from its ends, and a weight of 28 tons is suspended from the center of the rail. The deflection under this weight, measured on the distance between the centers of the bearings, must not exceed ⅝ of an inch after the weight has been on the rail 30 minutes. No permanent set must appear after the removal of the load.

The same piece of rail is then supported as before, and a cast iron monkey, weighing one ton, will be allower to fall freely upon the center of the rail from a height of 20 feet. The rail must bear two such blows without showing the least sign of fracture. Should the rail fail, then two more pieces from the same cast should be tried, and if satisfactory, then the cast may be accepted. The permanent set caused by the first blow must not exceed 4 inches. The total deflection of the rail, measured on the distance between the center of the bearings after both blows have been given, must not exceed 8 inches The rail is then to be broken by further blows, when it must show a perfectly sound and homogeneous fracture, of such a character as shall be satisfactory to the inspector.

If any rail tested shall fail to comply with any of the above-named tests, the cast to which it belongs will be rejected, for which purpose every rail must have distinctly stamped upon it at both ends the number of the heat. The writer has little criticism to make of the sections rolled. They conform pretty well to templet. The chemical specifications are more liberal than in America, especially as regards sulphur and phosphorus. A spread of 20 points in carbon is also very liberal. Pieces of rails on analysis must comply with the following analysis:

	Per cent
Carbon	0.40-0.60
Phosphorus, less than	0.075
Sulphur, less than	0.05
Silicon, less than	1.00
Manganese, less than	0.90

Should any piece of rail analyzed not comply with these conditions, the cast from which it is taken shall be rejected and fresh samples taken from the remainder. The standard rail used on many railways in China, orders for which have been placed with the Hanyang mills, is the 85-pound per yard Chinese section. Certain radii are different and there is slightly less weight in the flange. The height and base are identical.

The furnaces and mills which have just been described above constitute the main units of the Hanyang Iron & Steel Works. From a 1922 American standpoint not a single one of these units, with the possible exception of No. 3 and No. 4 blast furnaces could be kept in operation. From the standpoint of efficient consumption of blast furnace output, the steel works are a failure and likewise the mills. From a tonnage standpoint alone, these mills are an expensive luxury and the situation cannot be made better unless the open hearths and mills are scrapped and new continuous rail and universal plate mills are erected at Tayeh where there is plenty of room and good ground for foundations, checker chambers, etc.

The Chinese management began to realize this last year and shut down all the mills and open hearth furnaces last November. While no official of the company will commit himself, it is almost certain that the present mills are considered obsolete by the management and there is little chance that they will ever make steel in any quantity again.

Price of Rails Is $71

Figures on the cost of steel rails, f. o. b. plant, are not officially available but it is known through an accredited source that just before closing down the rail mill, Hanyang rails were costing not less than 95 tael per ton or about $71 gold. Rails from the United States were selling c. i. f. Shanghai for $50 gold per ton, so the situation is bad for the Hanyang product.

The primary reason for the high pig iron and steel costs at the Hanyang plant of the Han-Yeh-Ping Co. is the excessively high cost of coke. Not only is coke expensive due to costly transportation by rail and to rising coal mining charges, but it is none too good because it is friable and high in ash and moisture. However, if the cost of coke could be reduced substantially, the physical drawbacks could be withstood and a reasonably priced iron made. Until coke is delivered at the furnace stock house at a cost approaching that in America, China will continue, as she is today, a country without a steel industry.

Nitrogen Employed as a Protective Cushion

A new principle in transformer design, claimed to eliminate the possibility of explosions which sometimes occur in large units, has been developed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and incorporated in a 25,000 kilovolt-ampere bank of power transformers to be installed in the Grand Tower Illinois station of the Middle West Power Co. The new principle consists of filling the transformer case above the oil level with nitrogen, a harmless and inert gas incapable of forming an explosive mixture with oil vapors arising from the oil.

The nitrogen gas is generated in a device of simple design which is attached directly to the transformer tank. The generator operates automatically to keep the space above the oil level always full of the protective nitrogen. No oxygen, which is the element required to produce explosions or start a fire, can enter or be present in the tank. The protective layer of inert gas above the oil level acts as a cushion or buffer to take the shock of any sudden pressures that develop under the oil level in case of a short circuit or any defect in the transformer windings.

An electric arc under the oil level can produce a tremendously quick pressure in a tank. The sudden impact of this pressure against the walls and cover of a transformer tank which is completely full of oil has been known to burst the tank and cause a serious interruption of service. The nitrogen gas cushion is compressed easily and is capable of taking the brunt of the explosive pressure and save the tank from injury.

Adoption of a code of ethics, governing its membership of approximately 20,000 is announced by the American Society of Mechanical Engineers. The code commands loyalty to country, personal honor, fairness to contractors and workers, and interest in the public welfare. Betrayal of professional confidences, undignified or misleading advertising, and questionable professional associations and practices are prohibited.

Permeability of Malleable High

Magnetic Properties Make This Material Suitable for Frames of Small Motors and Generators Used on Automobiles—Castings Are Produced with Large Risers Which Serve To Feed the Metal as It Shrinks

BESIDES possessing the combined qualities of strength and ductility which, with its important casting properties, have made it such a useful casting metal, malleable iron possesses high magnetic permeability and low hysteresis, especially at the lower densities. This magnetic quality makes it available for small motor frames in competition with steel, which, while of a higher permeability, is sometimes more expensive and usually machines less rapidly. Fig. 3 is a permeability curve of malleable iron, made by Edward Hughes, Dayton, and shows graphically the relation between the magnetizing force and the resultant magnetic inductance. The rapid rise of the induction at the lower densities of the magnetizing force is clearly indicated. But at the higher densities this slopes off much more rapidly than is the case with cast steel.

The Dayton Engineering Laboratories Co., Dayton, O., avails itself of the magnetic properties of this metal and employs it in the frames for generators and motors in its automobile starting and lighting systems. Fig. 2 shows the method of molding a side frame for the generator used on a popular six-cylinder car as applied by the Dayton Malleable Iron Co. As may be noted from the pattern on the squeezer machine, two down gates are used for pouring the metal and a large feeding riser is supplied. This may be more clearly seen on the casting on the bench. The metal is poured down the gates through two strainer cores, *AA*, Fig. 2 and under these cores both streams part into two runners to the casting on each side of the strainer core. The drag mold below the cope indicates the size of the neck of the riser, at *B*. A dry-sand core is placed over the riser opening in each mold. This not only prevents dirt from falling

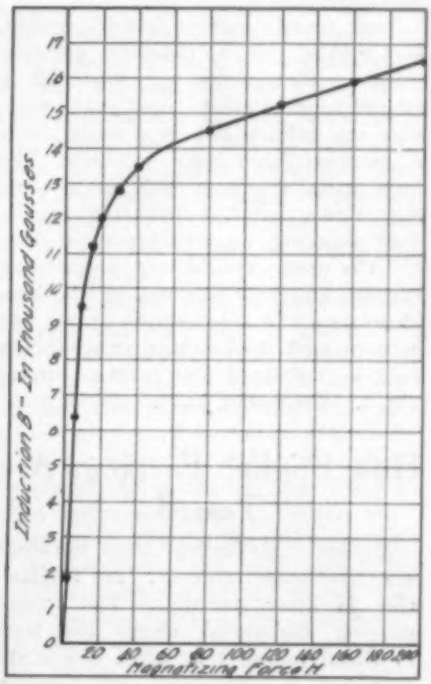

FIG. 1—ABOVE—MOTOR FRAME CASTINGS ARE POURED WITH A HORN GATE. FIG. 2—AT THE RIGHT—LARGE RISERS ARE PLACED ON GENERATOR FRAME CASTINGS. FIG 3—AT THE RIGHT ABOVE—PERMEABILITY CURVE OF MALLEABLE IRON

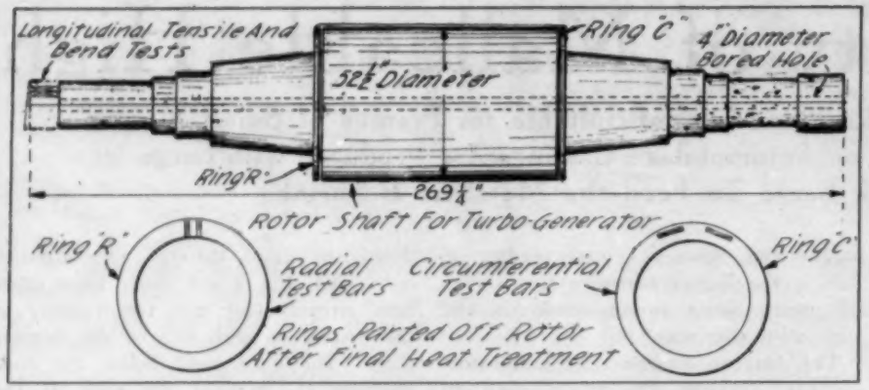

FIG. 1—SKETCH SHOWING HOW THE BARS ARE CUT OFF LARGE FORGINGS

into the mold, but has been found helpful in eliminating blows in the mold, when poured.

The round motor frame castings are molded by a radically different method. The molds are made on a jar-ramming machine and the castings are poured, two in a mold, from a separate horn gate to each. The horn gates are connected to a common down gate as indicated in the drag standing on the bench in Fig. 1. The sprue attached to one of the castings also may be noted in the same illustration. Large shrink balls are used to feed the castings as are shown both in the mold and in the pattern, Fig. 1. The casting has a 4¼-inch draw.

How English Forgings Are Tested

Methods of testing large forgings are somewhat different in England than in other countries. The accompanying illustration shows the tests to which forged steel rotor shafts are subjected in England and gives a clear idea of the conditions which the manufacturer must fulfill. Test bars are taken from the end of the forging and from two rings which are cut off the body as shown in Fig. 1. Bars are cut from the rings so that the metal is tested both radially and circumferentially and in addition the bar cut off the end tests the metal axially. The forging shown in the accompanying illustration was made by Walter Somers Ltd., Hales Owen, England.

The weight of the finished forging was 92,400 pounds, its overall length being 269¼ inches and its maximum diameter 52½ inches. A 4-inch diameter hole is bored through from end to end. It was forged from a solid ingot of acid open-hearth steel. The test pieces taken off the end showed the following results:

	Actual result on test bars	Qualities called for in specifications
Breaking stress, pounds per square inch	86,732	78,400
Elongation in 2 inches, per cent	26.5	25
Reduction in area, per cent	42	40
Yield point, pounds per square inch	45,785	39,200

Three bend test pieces cut from the end were bent through an angle of 180 degrees without showing any sign of fracture. The rings R and C were cut off the rotor after the final heat treatment. The results on these rings were as follows:

Radial Test Bar

	Actual result on test bars	Qualities called for in specifications
Breaking stress, pounds per square inch	85,747	78,400
Elongation in 2 inches, per cent	20	18
Reduction in area, per cent	36.3	32
Yield point, pounds per square inch	44,800	39,200

Circumferential Test Bar

	Actual result on test bars	Qualities called for in specifications
Breaking stress, pounds per square inch	88,883	78,400
Elongation in 2 inches, per cent	26	20
Reduction in area, per cent	39.2	35
Yield point, pounds per square inch	44,352	39,200

Loss in Melting Reduced

In stating that the substitution of electric furnaces for the crucible and oil-fired types in the brass-melting industry would bring tremendous economies, the federal bureau of mines estimates that the war expenses of the United States would have been reduced more than $20,000,000 if all the brass made in the country in 1917 and 1918 had been melted electrically. In old-style furnaces the loss of zinc through evaporation is as high as 6 per cent in making brass castings and 10 per cent in making wrought brass. The electric furnace is said to reduce these losses to a negligible quantity.

Coke Exports Increase

November exports of coke totaled 38,397 tons valued at $492,495 compared with 30,347 tons valued at $254,484 in November, 1921, states the department of commerce. In the first 11 months of 1922 coke exports amounted to 333,291 tons valued at $3,469,559 against 250,854 tons valued at $2,563,239 in the same months of 1921.

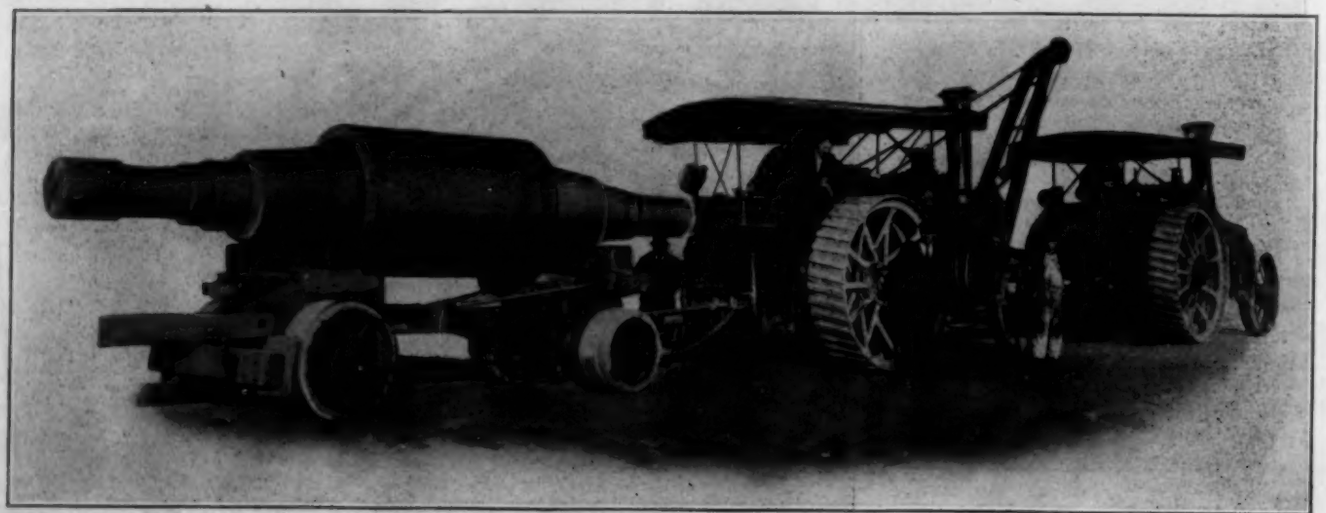

FIG. 2—THE 41-TON FORGING WAS SHIPPED BY ROAD ON A SPECIAL TRUCK HAULED BY TWO TRACTION ENGINES

Safety in Compression of Gases

Air, Oxygen, Nitrogen, Argon, Carbon Dioxide, Hydrogen, Acetylene, Ammonia and Chlorine, Some of the Common Gases Used in Industry, Present Hazards When Placed Under Pressure—Safe Practices Are Described

BY A. D. RISTEEN

COMPRESSED air is used for many different purposes and at many different pressures, but so far as safety is concerned it is sufficient to distinguish two main problems. First, we have to deal with cases in which the ultimate pressure desired does not exceed, say 200 pounds per square inch; and second, the special case in which the compression must be pushed to perhaps 3000 pounds per square inch, for the production of liquid air.

When the ultimate pressure is not greater than 75 pounds, the compression usually is effected in a single operation; but it would seem better to adopt two-stage compression for pressures approaching or exceeding this limit. Three stages, at least, should be used for pressures in the neighborhood of 1000 pounds, and to push the pressure from this point up to 3000 pounds a fourth stage or operation should be employed. It is advisable to use long-stroke compressors, with low piston speed, not only to avoid unnecessarily high temperatures, but also because less lubrication is needed.

Efficient Cooling Necessary

Every now and then there is an explosion in connection with an air compressor, and the results are sometimes quite serious. Most of these explosions probably are associated more or less directly with the lubrication of the compressor cylinders, and with inefficient cooling of the air that is undergoing compression. In an ordinary compressor the temperature of the air rises considerably during the compression stroke, and it is of the utmost importance to keep this rise of temperature within reasonable bounds. A good deal can be accomplished in this direction by surrounding the cylinders with effective water jackets. The cooling water in these jackets should circulate actively and copiously, and thermometers should be provided to show the temperature at which the water is entering and leaving. To guard against stoppage of the flow of cooling water from any cause, it is also important to provide some positive means for showing that the circulation is free and plentiful at all times. It is advisable, for example, to have the discharge from each jacket located where it is plainly visible to the men working about the room.

It is not sufficient, however, to provide the compressor cylinders with water jackets. The air should be passed through a special cooler immediately after leaving the compressor and its temperature brought down near that of the surrounding atmosphere as quickly as practicable. Moreover, if the compression is effected in two or more stages, an intercooler between each stage and the next one should be provided, so that every cylinder will be supplied with air at a moderate and reasonable initial temperature. The use of efficient cooling devices tends not only to insure safety but also to lessen the cost of compression, because cooling reduces the pressure as well as the temperature.

In compressing air to moderate pressures the cylinders are lubricated with oil. Oil may also be used in the first stages of high compression apparatus, though water is preferable for the final stages. The composition and physical characteristics of the oil should be carefully considered.

As a general rule, too much oil is used in lubricating the cylinders of air compressors. It takes considerable experience to determine just the right amount, and what is right with one machine or one grade of oil may not be right with another. In a general way, however, it is safe to say that the lubrication is ample if the cylinder walls are always coated with a slight film of oil. It is often assumed that the explosions that sometimes occur in connection with air compressors are due to the ignition of oil vapor or of oily mist. It would be hard to justify this theory. Whenever a compressor cylinder discharges the air that it contains, the oily vapor or spray that is present is discharged at the same time, and it is hard to see how a quantity sufficient to produce a serious explosion could accumulate. Moreover there are comparatively few explosions in which the initial break is in the compressor cylinder.

More commonly the first rupture occurs in the discharge pipe or the receiver, and trouble at these points can be minimized, and perhaps entirely avoided, by: 1. Quick and efficient cooling of the air; 2, thorough drainage of the oil that tends to collect in the piping and receiver; and 3, careful attention to the discharge valves on the compression apparatus. Considerable quantities of oil are likely to accumulate in the discharge pipe and the receiver, and if either of these bursts, a large amount of hot oily spray is likely to be discharged into the air, and this may take fire either spontaneously or from some external source, with a bad oil-vapor explosion as the result. Suitable traps and drains must be provided to prevent the accumulation of the oil, and in this way the oil hazard can be largely or wholly removed.

If the exhaust valves of the compression apparatus are leaky, then upon the return stroke more or less of the compressed and heated air will find its way back into the cylinder, so that the temperature of the air in the cylinder upon the next compression stroke will reach a much higher point than the designer of the apparatus intended. Carbonaceous deposits, produced by the carbonization of the lubricating oil, often collect in considerable quantity in and around the exhaust valves, and these may sometimes take fire, or they may prevent the valves from closing tightly. Exhaust valves should be carefully watched for such deposits, and should be kept as clean and tight as possible.

How Oxygen Is Handled

Oxygen is compressed and shipped in vast quantities and is used in the greatest imaginable variety of ways. Before subjecting it to compression it is essential to know that the oxygen is pure, and especially to know that it is not contaminated with any other substance with which it could combine, either during compression or in the course of subsequent handling. For example, if it is prepared by the fractional distillation of liquid air, it is important to know that the air that was subjected to liquefaction was free from smoke particles, from organic dust of any kind, and from coal gas, acetylene, and every other substance of an oxidizable nature. If the oxygen was produced by the electrolysis of water, it is equally essential to know that it is not con-

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From a paper presented at the annual meeting of the American Society of Mechanical Engineers, at New York, Dec. 4-7. The author is director of technical research and safety publication work, Travelers Insurance Co. and Travelers Indemnity Co., Hartford, Conn.

taminated by hydrogen. It is easy enough to insure purity in all these respects, but the importance of not neglecting the necessary testing, and the purification operations when these prove to be needed, cannot be overemphasized.

In handling compressed oxygen it is supremely important to prevent the gas from coming in contact with oil or grease either during the compression or while the oxygen is being stored, transported, or utilized; and in view of the fact that many exceedingly serious accidents have occurred in consequence of neglecting this principle, the author wishes to emphasize the hazard just as strongly as he can. When a man talks with appropriate earnestness about the danger of allowing compressed oxygen to come in contact with oil, grease, or other combustible organic materials, it is easy for the uninitiated to believe that he is inspired by unreasonable timidity, but this is not the case.

Those who have followed the history of oxygen compression are well aware that many accidents have occurred under conditions that thoughtful and experienced men would not have considered to be at all likely to produce trouble. The use of even a slight trace of oil in the compressor is exceedingly hazardous, not only on account of the danger of immediate combustion, but also because some part of the oil is bound to go over with the compressed gas; this will collect in the tanks or cylinders used for storage purposes, and sooner or later serious results will surely follow. It is probably safe to say that most of the accidents that have occurred in connection with compressed oxygen have been due to lack of appreciation of the importance of this thing. The trouble is not confined, of course, to the mere combustion of the oil itself. The metal parts of the apparatus will burn freely as soon as they become sufficiently heated by the ignition of the oil or grease, and the consequences may transcend imagination.

Lubricating With Pure Water

The only absolutely safe thing to use for the lubrication of an oxygen compressor cylinder is pure water, which should be introduced into the suction pipe in the form of a visible spray. Under special conditions it may happen that pure water is not sufficient, and in a case of this kind it may then be permissible to dissolve a little soap in it; but soap should not be used when water will suffice, and it should never be used without first proving, by actual analysis, that the particular supply to be dissolved contains no uncombined or unsaponified oil or grease. The packings used on the compressor must also be entirely free from oil, grease, or graphite. Special packings, made for this express purpose, should be employed.

The compression of oxygen is often, and perhaps usually, carried up to about 2000 pounds per square inch, and it should be effected in not less than three stages. In speaking of the compression of air, the importance of prompt and effective cooling has been emphasized, and much greater attention should be paid to this point when compressing oxygen. The pump cylinders should be water-jacketed, the circulation of water should be positive and abundant, and the apparatus should be so designed that cessation or diminution of the flow of jacket water cannot escape immediate notice. The gas should also be passed through effective intercoolers between each compression stage and the one next following; and immediately after leaving the last cylinder of the compressor it must be passed through a final cooler, and brought down to the temperature of the surrounding atmosphere.

Be Careful of Receptacles

It is exceedingly unwise to introduce oxygen into receivers of any kind, unless these receivers are known to be perfectly clean internally and wholly free from oil, grease, and other combustible substances. The author would like to see some kind of a regulation established forbidding every oxygen manufacturer to fill any tanks other than his own. This principle already is followed, it is believed, by some and perhaps all of the larger manufacturers, but unfortunately it is not followed by everybody. Moreover, oxygen should never be compressed into containers that have been used for other gases. When a cylinder or tank has been previously used for holding compressed gases other than oxygen, there is likely to be an accumulation of oil upon its inner surface, because oil may have been used for cylinder lubrication in connection with the compression of these other gases, and it is hard to remove such oil thoroughly enough to make the tank safe for oxygen.

Nitrogen gas has a far narrower range of application in the arts than oxygen, yet it is compressed and shipped to a certain extent. This gas was used during the war in the recoil cylinders of certain types of guns, and it has also been used to a limited extent for blanketing combustible liquids and for supplying a neutral atmosphere for other purposes, where the presence of a gas with active chemical properties would be objectionable. At the present time compressed nitrogen is supplied mainly, it is believed, for filling incandescent electric lamps, and in connection with the manufacture of automobile tires. The gas itself is coming into use for the direct manufacture of ammonia, nitric acid, fertilizers, and other nitrogen compounds from the atmosphere; but chemical plants in which this kind of work is done usually prepare their own nitrogen and do not subject it to compression except as the process may require it to be under pressure.

Nitrogen forms four-fifths of the bulk of the atmosphere, and as it is nearly inert in its elemental form the precautions that are recommended in connection with the compression of air are also adequate when compressing nitrogen. It should be noted, however, that the nitrogen that is used for filling electric lamp bulbs must be free from hydrocarbons, and this means that when the gas is to be employed for this purpose it is not permissible to use oil for lubricating the compressor cylinders. Water should be used instead. For certain reasons, in fact, it is best to avoid oil altogether and to lubricate with water in all cases. This does not mean, however, that there is any danger of direct chemical action between the oil and the nitrogen. Nitrogen usually is compressed to about 2000 pounds per square inch, and the compression should be performed in three stages.

Argon, like helium and neon, has no chemical properties whatsoever. It forms no compounds and is absolutely inert under all circumstances. Hence it cannot produce fires or explosions. Moreover, it is not poisonous. It is obtained from liquid air, however, and when first separated from the air it is mingled with a large proportion of oxygen—the mixture usually containing about 65 per cent of oxygen and 35 per cent of argon. When it is handled in this state it must therefore be treated like oxygen; but after it has been freed from the admixed oxygen it may be compressed under the same conditions as nitrogen. For shipment it is usually compressed to a pressure of 1800 or 2000 pounds per square inch in three stages.

Handling Carbon Dioxide

Carbon dioxide is compressed in large quantities and is used for the most varied purposes. As is well known, it will neither burn nor support combustion, and the author does not recall any chemical dangers which are likely to be encountered in its compression. It is not especially poisonous, but when a considerable quantity of it is mixed with air that workmen have to breathe, it replaces the life-giving oxygen to a corresponding extent, and this may mean that the air is not fit for respiration. The effects of carbon dioxide in this way are sometimes insidious, especially as the pure gas is without odor or color; and it is therefore evident that special care should be taken to provide free and

copious ventilation at all times in buildings in which carbon dioxide may escape by leakage or otherwise.

In connection with hydrogen and most of the other combustible gases, such as propane, the chief danger associated with compression probably consists in the likelihood of fire or explosion in case of leakage or of contamination with oxygen. If the hydrogen is prepared by the electrolysis of water, there is always a possibility that oxygen may be present in it in small amounts, and the gas should be carefully tested, either at short intervals or preferably by some continuous process, to make sure that the oxygen content is always well below 5 per cent. Small amounts of oxygen can be removed by passing the gas over palladium pumice, which causes the oxygen to combine in a quiet way with an equivalent quantity of hydrogen.

The danger of admixture with air or oxygen is not in any way restricted to hydrogen prepared by the electrolytic process. Air may leak into the suction pipe leading to the compressor, whatever the source of the hydrogen; and this, in fact, is one of the hazards that must be watched most carefully in handling this gas. The suction line may be fitted with tests cocks or drainage valves, when this is the case it is exceedingly important to keep them closed except when they are opened for legitimate purposes and at proper times. It is believed, moreover, that all such cocks and valves should be kept locked, and that the keys should be in the keeping of some designated, responsible man. To guard further against trouble from this source and from accidental leakage, the whole operation should be conducted so that there will be a positive pressure in the suction line at all times. Care should also be taken that the gasometer does not stick and that its seams are kept absolutely tight.

Danger From External Leakage

It is important to consider the possibility of leakage outward as well as inward. Hydrogen is usually compressed to a pressure of 1800 or 2000 pounds per square inch, and at high pressures a good deal of gas will escape through a small hole in a short time. If hydrogen gets out into the room and is allowed to collect there, a serious explosion is likely to result. Every discoverable source of ignition should be carefully considered and safeguarded. Rigorous measures should be taken to prevent the men from smoking or using matches or other sources of open flame. The artificial lighting should be provided by incandescent electric lamps inclosed in vapor-proof globes, and it is safest to mount these lamps outside of the windows, locating them so that they shine through the window glass into the interior. All electric wires should be run in closed conduits, and the fuses should invariably be outside of the region of possible danger. This applies also to switches, unless they are of a type which cannot produce an arc or flame. No electric motors should be used in rooms where hydrogen, propane, or any other combustible gas may escape in quantity, unless these motors are specially designed for this particular application, or else thoroughly ventilated with fresh, pure air from the outside of the building. And these various precautions should be observed not only where the hydrogen is compressed, but also wherever it is stored—either in gasometers or in cylinders. Finally, it is exceedingly important to provide abundant ventilation at all times to lessen the chance of fire or explosion in case the various other precautions prove inadequate.

Left-handed threads are extensively used for fittings that are to be employed in connection with hydrogen, the purpose being to prevent the accidental connection of hydrogen lines or cylinders with pipe lines conveying other gases, and especially with those containing air or oxygen. It is to be regretted that in many plants the purpose of the left-handed thread is deliberately defeated by making use of devices known as "adapters." These are in effect right-and-left couplings, which are provided for the express purpose of making it possible to attach a cylinder with a left-handed thread to a pipe line having a right-handed thread.

No person should ever undertake to compress acetylene unless he fully understands the properties of the gas and knows exactly what it is permissible to do and what he must carefully avoid doing. This is not meant to imply that the compression of acetylene is a dangerous operation when it is performed under the direction of a properly qualified man, but is intended as a special note of warning to those who are tempted to compress the gas without first understanding its properties. Acetylene is an endothermic compound, and this formidable word has frightened a great many persons who do not understand its exact significance. It merely means that heat is absorbed instead of emitted when acetylene is formed from its constituent elements. Now it is well known that substances of this kind are likely to be more or less unstable under certain conditions, and acetylene is no exception to the rule; but the conditions under which the instability exists are well known, and it is only the man who does not understand them, or who is pleased to ignore them, who gets into trouble.

In compressing acetylene it is important to keep the temperature of the gas as low as practicable at all times. Expressed in more definite language, this means that the compression must be effected by a pump moving with a low piston speed, and that it must be performed in not less than three stages. It also means that the pump cylinders should be kept as cool as practicable by a plentiful supply of water drawn from the coolest available source. The author cannot state any definite temperature at which the gas may become instable during the act of compression, and in fact it is doubted if anyone knows what that temperature might be. The only thing that we can say is, that if the operation is conducted as here described, there is apparently no danger from instability.

Oil May Be Used

It certainly is not safe, however, to store acetylene in otherwise empty cylinders, at the pressure at which the compressor pumps deliver it. There appears to be a time element involved here, and it is probable that a certain amount of polymerization gradually occurs in strongly compressed acetylene, except when it is stored in special receptacles containing suitable porous material charged with liquid acetone, so that in the course of time small quantities of other more sensitive substances are formed, which serve to lessen the stability. At all events, we know that acetylene should not be stored in an otherwise empty tank at a pressure of more than 15 pounds per square inch greater than the normal pressure of the atmosphere, and yet we know that explosions in the compression pumps, and in the delivery pipes leading from them, are exceedingly rare if the compression is effected as here described. In fact, the author knows of only one case of the sort, and this was precipitated by the breakage of a steel valve spring, which quite possibly struck a spark and thereby caused the development of a high temperature within the tiny space filled by the spark itself.

Oil may be used for lubricating the cylinders of acetylene-compressing pumps, but it should afterward be removed by passing the compressed gas through suitable separators as it leaves the compressor. And immediately upon leaving the oil separator the acetylene should be passed into the storage cylinders, which, as previously stated, must be filled with a special porous, solid material thoroughly impregnated by liquid acetone, which dissolves the acetylene and holds it safely in solution.

It should not be necessary to issue a warning against mixing other gases with acetylene in the storage tanks, or using acetylene storage cylinders for any purpose whatsoever, except for holding pure, unmixed acetylene in addition to the safety filling.

Ethyl chloride, methyl chloride and

propane are used to some extent as refrigerating agents, but it does not appear desirable to discuss their compression in any detail. They are all inflammable, and hence must be handled with due regard to the possibility of fire and explosion. Propane like butane does not require lubrication in the compressor cylinder, because the substance itself affords sufficient lubrication. It is necessary, however, to lubricate the stuffing box of the compressor. There has been some difficulty in connection with the lubrication of cylinders in which the chlorides of ethyl and methyl are compressed. Castor oil has been used, but it is not satisfactory. Glycerine is said to be much better, though still far from ideal. It is said that a new lubricant, consisting of ethylene and propylene glycol mixed with deflocculated graphite, and specially adapted to ethyl and methyl chlorides, and to propane, is now available. In handling these and all other inflammable gases the various special precautions mentioned in connection with hydrogen should also be observed.

Liquefied ammonia is used in immense quantities in connection with refrigerating machinery, and although it perhaps cannot be called a poisonous gas in the narrow sense of the term, it is easily capable of producing unconsciousness and death when it is present in the air in any considerable amount. Similar remarks apply to sulphur dioxide gas, which is also used in refrigerating machinery as well as in various other applications. Both of these gases are freely soluble in water, and it is recommended that in all rooms in which they are handled an overhead sprinkling system be provided that is capable of discharging large volumes of water into the room in case of the accidental liberation of excessive quantities of either gas. A considerable part of the liberated gas would be absorbed by the down-rushing water, and even though the air might not be rendered respirable in this way, something would surely be gained in the way of checking the spread of the gas to other rooms. It certainly is important to provide free and abundant ventilation and adequate means for quick exit in connection with any room in which either gas may suddenly be liberated in quantity. These simple and evident precautions are often wholly disregarded in laying out plants in which ammonia or sulphur dioxide are handled or used.

Ammonia May Cause Explosions

Ammonia gas is usually pronounced incombustible and incapable of being exploded when mixed with atmospheric air, but research and experience have shown that this is not altogether true. A mixture of ammonia gas and air can be exploded if it contains from 16 to 27 per cent of ammonia, and some of the explosions that have occurred in our big refrigerating plants subsequent to the liberation of considerable quantities of ammonia may possibly have been due to the ignition of mixtures of this kind by means of the arc lamps which have in most cases been in use in rooms where these accidents have occurred. The limits given, while not guaranteed to be the exact ones within which the explosibility exists, are at least approximately correct.

In compressing ammonia another source of danger must be carefully considered. If the ammonia gas that is undergoing compression is allowed to become unduly hot, the ammonia that comes away from the compressor will contain a notable quantity of combustible gas that is distinctly different from ammonia. This may come in some measure from the decomposition of the oil that is used in lubricating the compressor cylinder, but it also contains free hydrogen, which appears to be produced by the actual dissociation or breaking up of the ammonia into its component gases, nitrogen and hydrogen.

We used to think of ammonia as being exceedingly stable and incapable of dissociating in this way to any sensible extent, but we now know that such is not the case. Dissociation occurs even at moderate temperatures, and it is likely to become quite significant when the temperature is high. To guard against the development of combustible decomposition products from the lubricating oil, it is important to use a special kind of oil which experience has proved to be well adapted to work of this kind; and to keep the dissociation of the ammonia itself within as low a limit as practicable, it is important to keep the gas as cool as possible by methods already outlined in connection with other gases. Finally, to guard against vapor explosions in case ammonia gas should escape into the air in considerable quantity, it is important to take the same precautions against ignition sources that have been suggested in connection with hydrogen.

Liquid chlorine is now shipped in vast quantities, for use in connection with bleaching, and for many other purposes. It has been greatly feared by the general public ever since it was used as a military gas in the war, but in time of peace this fear is hardly justifiable. Chlorine is exceedingly irritating, and it can produce unconsciousness and even death if inhaled in any considerable quantity. It has been well described as an "honest gas," however, the phrase meaning that it has no treacherous qualities. We always know exactly what it will do. When the air on a battlefield was heavily charged with chlorine, there was no place to go in order to be rid of the gas; but in a manufacturing plant, or in a plant in which chlorine is compressed, immediate relief can be had, in case of leakage, by merely leaning out of an open window or going out of the room.

It is not desired to underrate the dangers associated with handling liquid chlorine, yet it is only fair to say that they have been largely exaggerated. The gas is far from being like St. George's dragon, and it even has some redeeming features. If a cylinder or a tank containing liquid chlorine bursts or springs a leak, for example, the evaporation that takes place rapidly chills the liquid still remaining in the tank, so that the evolution of gas is quickly and automatically checked, though not wholly stopped.

Gas Must Be Dried

Chlorine must be carefully dried before compression, because if it is moist it will corrode the pump, piping, and tanks. Perfectly dry chlorine, on the other hand, has practically no action upon iron. The drying is effected by passing the gas through towers filled with pumice wet with concentrated sulphuric acid. In liquefying the gas by means of a compression pump the main difficulty to be overcome is keeping the piston gas-tight in the compression cylinder. A special form of packing is required for this purpose, and it should be designed and installed by some person who understands the necessities thoroughly. In one compression plant visited by the author there are seven sealing rings on the piston—six soft and hard packings of special chlorine-resisting material being used, while the middle space is filled with strong sulphuric acid which not only completes the seal but also serves to lubricate the cylinder. In liquefying this gas the compression is performed in one operation.

In conclusion, there is one general suggestion relating to safety-valves which applies to all gases. Some engineers discourage the use of safety valves on gas compressing apparatus, partly because the escape of gas through them is a source of waste, and partly because it creates a special hazard, when the gases are toxic or inflammable. But it is not necessary to liberate the escaping gas at or near the work place, and it can often be discharged where it will not constitute a hazard to property. Hence this objection is not altogether well founded. In fact, relief valves should be provided in all cases, and the discharge problem should be considered on its own merits in each individual plant. It is often, and perhaps usually, practicable to have the discharge delivered back into the piping system on the low-pressure side of the compressor, so that there is no economic loss, and no hazard to the men nor to property.

Deals With Mechanical Handling

The Mechanical Handling and Storing of Materials; by George Frederick Zimmer; cloth, 804 pages 7 x 10¼ inches; published by D. Van Nostrand Co., New York and furnished by IRON TRADE REVIEW, Cleveland for $15.00 net.

Present industrial conditions together with the large increase in the wages paid workers, have made it necessary for managers in all branches of industry to exercise strict economy in every department, and at the same time to increase the total output with the same number of workers employed. It is only by means of the time-saving and labor-aiding devices that this greater production can be realized. One of the greatest methods for saving time and labor, and one which is constantly increasing in use, is the mechanical handling and storing of materials. This is the third edition of the book on handling materials with a thorough discussion of the subject of storing of materials added.

In the first part of the book the subject of continuous handling of material is discussed, with chapters dealing with elevators and conveyors. The subject of conveyors dates back to the time of Archimedes, when it is claimed that he invented a worm conveyor, of simple design, but practically unsurpassed till within comparatively recent years. The subject of conveyors is broad, covering such construction as push plate or scraper conveyors, push through conveyors, band, steel plate, slat, gravity, bucket conveyors, all of which are thoroughly explained, as well as the specific installations of conveyors to take care of the handling of coke in gasworks, coal conveyors, casting machines, etc.

By the use of pneumatic and hydraulic conveyors the materials are handled without coming into contact with any mechanical appliances. This method has been in use since 1818 for the handling of liquids and in 1871 for handling sand blast. The author explains this method of transportation, as well as the methods now in use for the mechanical disposal of ashes from steamers.

A variety of methods are now in use for the intermittent handling of materials, the important ones being the endless rope and chain, aerial ropeways, monorails, etc. The unloading of ships and railway cars presents one of the greatest problems for mechanical handling, and splendid progress has been made in this line. The last part of the book is devoted to a discussion of the unloading appliances for vessels and railway cars, miscellaneous installations and automatic weighing of material. The work is well illustrated with photographs and sketches of various installations and contains a trade directory of companies making different machines for mechanical handling and storing of materials.

* * *

Analyzes Steel Strike Report

Analysis of the Interchurch World Movement Report on the Steel Strike; by Marshall Olds; cloth, 475 pages, 5½ x 9 inches, published by G. P. Putnam's Sons, New York, and furnished by IRON TRADE REVIEW, Cleveland, for $2.50 net.

For review and discussion of this book see page 240.

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Lists Manufacturers

Hendrick's Commercial Register of the United States for Buyers and Sellers, 1923; cloth, 2321 pages, 8 x 11¼ inches; published by S. E. Hendricks Co., Inc., New York and furnished by IRON TRADE REVIEW, Cleveland, for $15.00 net.

The 1923 edition of this book contains information covering a wide range of industries, being especially devoted to the field of electrical, mechanical, hardware, iron, mill, mining, quarrying, chemical, railroad, steel, architectural, contracting and kindred industries. Products are listed from the raw material to the finished article, with the companies handling them from the producer to the consumer.

The annual reference book is divided into five sections. Under the heading "Index to Trades," any class of material or service may be found together with the classification number of the product or service required. The classified trade section lists the products alphabetically, except in the case of machinery and textile machinery, which, for greater facility are brought together under two main groups. The trade name section lists products manufactured under special trade name or brand, together with the manufacturers of each article. The name and location of companies are listed in the alphabetical section. In another section the names of advertisers are listed and also the products manufactured.

The book is intended as a buyers reference for contractors, engineers, exporters, government departments, jobbers, manufacturers, municipalities, purchasing agents, retailers, architects, and for factories, foundries, machine shops, mills, mines, railroads, etc. It is also of value in the preparation of mailing lists.

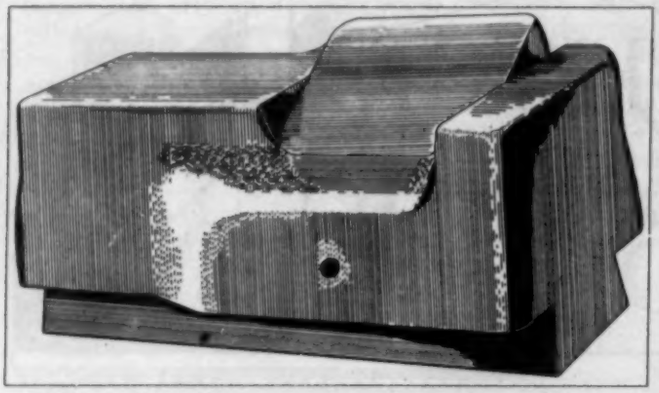
* * *

Treats the Study of Metals

An Introduction to the Study of Metallography and Macrography, by Leon Guillet and Albert Portevin; cloth, 289 pages 5¾ x 9½ inches; published by McGraw-Hill Book Co., Inc., New York and furnished by IRON TRADE REVIEW, Cleveland.

Metallography, the microscopical study of polished and etched metallurgical specimens, began in 1894 with the publication of a memoir on the constituents of carbon steels, by Monsieur Osmond. It was this paper that gave the impetus to the astonishing development of metallography.

In the investigation of metal failures the tendency has been to draw conclusions from microstructures which were based on the examination of a relatively small area, without taking into consideration the fact that the metal may not be homogenous. It is now recognized that in all such investigations, macrography, the study of the coarse structure of any given alloy or metal, must precede metallography,



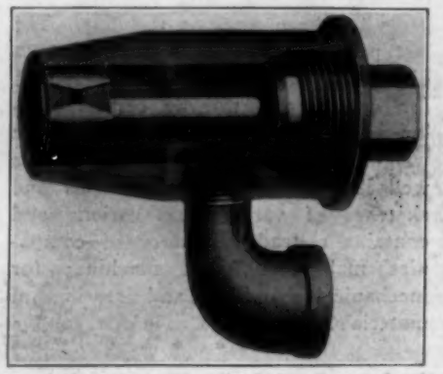
HAMMER DIE PROVIDED WITH A TILTING FACE FOR DRAWING TAPERS

otherwise quite erroneous conclusions are liable to be drawn.

The aim of this book is to outline principles and to illustrate them by means of the most typical and important examples. It is intended as an introduction to an extensive study of the subject. However, it should be of service, not only to those desiring to gain some insight on the subject but also to those engaged in the manufacture or using of metals. Only sufficient theory is introduced to render intelligible the behavior of metals and alloys. A feature of special value in the metallography section is the discussion of the relation between equilibrium diagrams of alloys and their properties and correct mechanical treatment. Other chapters in the book deal with the technique of macrography and its industrial applications, setting forth in a compact manner, the numerous ways in which the results given by this method can be made to build up the story through which the metal reaches its final form in any given case. The book is well illustrated with photographs, sketches and charts.

Fuel Oil Atomizer Uses Venturi Tube Design

Utilization of the venturi tube principle is presented in a new type of fuel oil atomizer manufactured by the Hauck Manufacturing Co., Brooklyn. From the sectional view shown in the accompanying illustration it will be noted that the burner consists essentially of a cylindrical casing containing a central bore closed at the outer end and provided on the periphery with slots parallel to the axis of the bore. These slots, with the inner wall of the casing, form longitudinal ports through which the atomized oil is driven into the furnace. Each port is a small venturi tube constricted at the center and flared out at the two ends. The constricted parts of the openings are connected with the interior of the bore through radial apertures shown in the illustration. The fuel, which may take the form of any fuel oil or even tar, is delivered to the bore under a pressure of 40 to 60 pounds and forced through the radial openings against the incoming air or steam, depending on which agent is employed as an atomizer. The compressed air or steam is delivered to the burner at a pressure that may vary from 30 to 100 pounds. The velocity increases as it flows through the ports and reaches its maximum at the constricted point in each



OIL BURNER BUILT ON PRINCIPLE OF VENTURI TUBE

opening. Here it blasts the fuel, atomizes it and drives it through the burner.

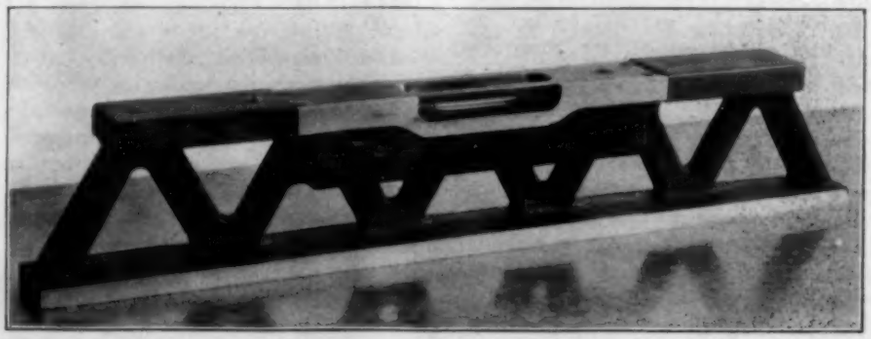
Builds New Combination Hammer Die

A new combination hammer die for drawing tapers has been introduced recently by Beaudry & Co., Inc., Boston. A view of the hammer die is shown in the accompanying illustration. One end is provided with a tilting face so supported that it moves freely on a fixed axis. The operator, by striking a light blow, automatically adjusts the tilting face to any desired angular position with relation to the top of the die. Any scale falling between the tilting face and the die holder is worked into a pit through grooves and forced out through holes in each side of the die holder so that the tilting face works freely at all times. The fixed plain part of the die face can be used for general forging the same as an ordinary die. The die can be furnished for any type of trip, air or steam hammer and will be found valuable in such work as flat, cape, diamond point and track chisels, calking tools, railroad spikes, keys, etc.

Develops New Level for Precision Use

A precision level for use in setting up precision machines recently has been introduced by the Pratt & Whitny Co., 111 Broadway, New York. These levels are made in three degrees of sensitiveness. In the 10-inch level, which is designed for regular shop use where precision instruments are required, each division of 1/10-inch that the bubble runs indicates a variation from the horizontal of 0.0005-inch in 1 foot. This level has a vial ground to a radius of about 170 feet. The frame is 15 inches long. The trusssd construction tends to make the frame light, rigid and convenient to handle. Insulating grips make it unnecessary for the operator to touch the frame when handling, thus decreasing the possibility of errors due to expansion from the heat of the hands. A view of the level is shown in the accompanying illustration

The output of automobiles by the Ford Motor Co. in 1922 totaled 1,352,479, more than one half the total output of all American companies during the year.



LEVEL DESIGNED FOR USE IN SETTING UP PRECISION MACHINES

Designs One Piece Type of Motor Rotor

A new development has been made in the rotor of a motor recently introduced by the Louis Allis Co., Milwaukee. In this new type of motor the entire winding of the rotor consists of an intergal sheet of copper, punched and formed by a special process. The one-piece winding is machined wrapped around the rotor core, the copper bars being expanded into the core slots by swaging, as indicated in the accompanying illustration.

The single joint which extends through the two end rings, is silver welded, after which the metal at both connections is processed by means of a contracting operation that rehardens the copper at the point where it was softened by the welding process. The rotor, being fabricated from thin sheets of copper having a high thermal conductivity, conducts the heat generated in it toward the ends of the rotor bars where the heat is dissipated through the action of malleable iron fans. The rotor core is a self-contained unit and may be pressed on and off the shaft readily as it has a straight keyway. Otherwise it is largely conventional except that it employs open slots without the usual overhanging tooth tips. While much stress has been laid on the mechanical strength of the motor, the electrical characteristics have also received attention. The motors are made in industrial sizes, voltages and frequencies.

Bill Proposed To Avert Strikes in Indiana

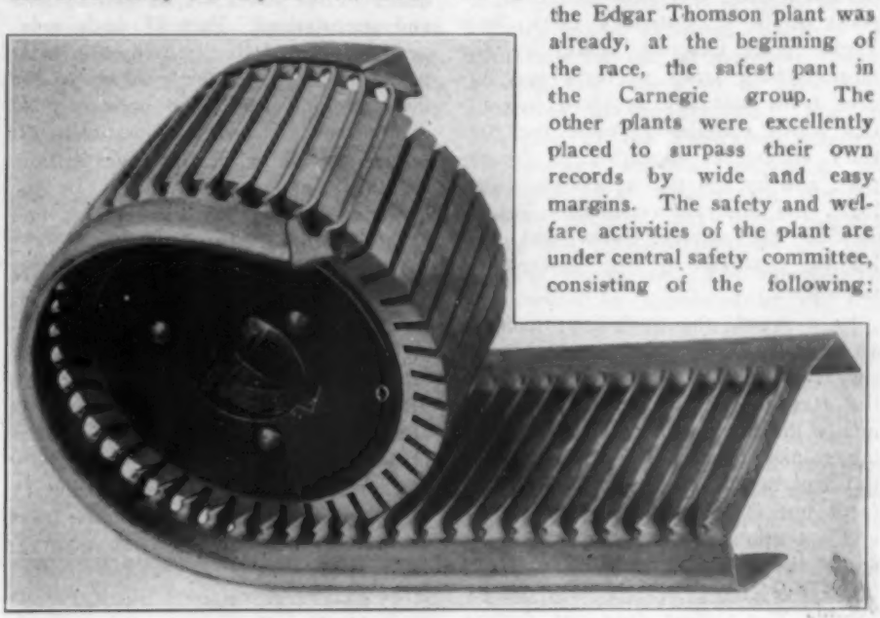
Indianapolis, Jan. 16.—A bill is to be presented to the next session of the Indiana general assembly to minimize strikes. It is entitled "an act to protect a person in his right to work for the support of himself or family, and providing penalties for violation thereof."

The measure would make it unlawful "for any person or persons acting jointly or singly with another or others, by means of any kind of force, threats, coercion, intimidation or violence, to cause or induce or attempt to cause or induce any person engaged in a lawful occupation to quit such employment, or to refuse or decline to accept or begin a lawful employment."

Punishment for a violation of the act would be imprisonment of not less than 60 days nor more than two years, and in addition a fine of not less than $50 nor more than $1000 might be imposed. The effect of the bill, its sponsors assert, would be to prevent organizers from calling a walkout, and in event work is stopped, it would prevent interference with other persons who might accept the employment. Confinement is mandatory in case of conviction.

Let Preliminary Contract on New York Terminal

A contract for preliminary work on the huge passenger and freight tunnel to connect Staten Island and Brooklyn, has been let by the city of New York to Patrick McGovern, Inc. It calls for the construction of the Brooklyn shaft and other work at a cost of $494,538.75. The shaft is to be located at the foot of Sixty-eighth street and Shore road, Bay Ridge, Brooklyn, and ground is to be broken within six weeks. The complete tunnel plans provide for two tubes under the Narrows, between Staten Island and Brooklyn, one for east and the other for westbound passenger and freight trains. It will be the longest underwater tunnel in the world and will extend two miles from shore to shore. The total length of the tunnel however, will be considerably longer than two miles. The Staten Island shaft will be constructed at St. George, near the present ferry landing, and there will be connections with the new municipal piers at Stapleton and with the Baltimore and Ohio railroad. In Brooklyn the tubes will have connections with the Fourth avenue subway and the Long Island railroad.



ROTOR WITH ONE PIECE WINDING MADE OF A COPPER STAMPING

Edgar Thomson Works Win Safety Trophy

At a recent meeting of the general safety committee of the Carnegie Steel Co., the bronze safety trophy formally was awarded to the Edgar Thomson steelworks, of Braddock, Pa., as the perpetual holder. The plants of the company competed last year against their own individual records for the past five years and the Edgar Thomson works led with 85.53 per cent accident reduction.

The Braddock plant won against great handicaps. It was necessary for it to exceed its own record in accident prevention by a larger margin than any other plant of the Carnegie company, and the Edgar Thomson plant was already, at the beginning of the race, the safest pant in the Carnegie group. The other plants were excellently placed to surpass their own records by wide and easy margins. The safety and welfare activities of the plant are under central safety committee, consisting of the following: O. J. H. Hartsuff, general superintendent; John B. Trusel, superintendent of safety and welfare; F. F. Slick, operating superintendent and chairman of works general safety committee; D. R. Ferguson, W. A. Drylie, Joseph A. Lawler, David Scott, H. R. Hunter, J. R. Evans, John Lloyd, E. S. Wright, J. A. Morgan, J. W. Forsythe, F. A. Power, Charles W. LeBreton, James Ball, George Small, F. H. N. Gerwig, James C. Callan, H. R. James, and J. R. Hunter.

The trophy was held for a period of a month by the plant making the best monthly record. In January it was won by the Duquesne plant, in February by the City Furnaces, in March by the Clairton steelworks, in April by the New Castle plant, in May, June and July by Edgar Thomson works.

During August the Farrell, Pa., plant won it, in September the Mingo Junction, O., plant, and in October and December the Edgar Thomson works, while in November, the Duquesne plant won.

Interchurch Steel Report Refuted

Complete Analysis Reveals Bias of Investigation and Amazing Misrepresentation of Available Evidence—Hand of Radicalism Is Shown

A SWEEPING indictment of the veracity, fairness and judicial honesty of the Interchurch World Movement Report on the Steel Strike issued in 1920 is presented in *the Analysis of the Interchurch World Movement on the Steel Strike,* by Marshall Olds, just published from the press of G. P. Putnam's Sons, New York. With exacting detail, by the most minute array of facts and figures from mutually accepted authorities which completely refute the contrary statements appearing in the report, and by the use of simple, direct logic, the analysis establishes beyond question the utterly biased and misleading character of the Interchurch document.

In a word, the analysis proves in a way that must be acceptable to any clear-thinking or fair-minded man the fact that the Interchurch report finally dissected is not a judicial finding gained from a careful and impartial ascertainment and weighing of the facts but is a product of radicalism and intentionally, has been made to serve the ends of radicalism as an impressive form of insidious propaganda. The author does not declare, however, that the representatives of the church who directed the investigation or passed upon the report are chargeable beyond a negative responsibility for the falsification and misrepresentation of facts in which the report abounds, as is clearly shown. At the most, it lays at the doors of those who directly organized and prosecuted the investigation, out of sincere and laudable motives, the capital error of having allowed themselves to delegate the actual work of field inquiry to an organization, the Bureau of Industrial Research of New York, organized and operated by men of radical convictions in industrial matters, and because of faith in these investigators and lacking the means or the knowledge to check up the alleged evidence, of accepting the findings of the latter substantially as presented.

Mr. Olds proceeds with his task with the utmost systematic care and completeness. The analysis is divided into two parts. Part I consists of a critical analysis of the evidence, arguments and conclusions of the Interchurch report, as to accuracy and adequacy of facts, logic of reasoning, soundness of conclusions and adequacy of the bases for its assumptions and speculations. Part II deals independently of Part I with the facts and circumstances which led up to the investigation, with the personnel of committees and other bodies that assisted toward or in the investigation, together with a brief history of the investigation and the composition and authorization of the report.

BY C. J. STARK
Editor Iron Trade Review

Instances almost without number are cited by Mr. Olds where the Interchurch report deliberately handpicked certain figures or partial quotations from accepted government and other public records to support its allegations; that by generalizing from insufficient evidence, it is repeatedly and conspicuously self-contradictory in regard to major conclusions; that by ingenious use of rhetoric, manipulations and rearrangement of context it endeavors to establish the very opposite truth and meaning that is clearly intended; that it argues from only one point of view and flagrantly and deliberately omits facts even those forming an integral part of the evidence that are in any way favorable to the steel companies.

By specific facts and figures taken largely from government and other authoritative reports, many of which likewise are quoted from in part by the Interchurch report the analysis controverts individually the allegations of barbarous and intolerable conditions of employment in the steelworks. The Interchurch report's, statements or allegations which are fully disproved or shown to be false or overdrawn because of distorted or only partial evidence, relate to the 12-hour day, the 7-day week, inadequacy of wages according to the American standard, the hazards of the business, the matter of steel profits and dividends, the response of the steelworkers to the strike call, police brutality and alleged injustice in the strike and other points which have been calculated to compel public sympathy. The author sums up his analysis of working hours in the steel industry in this way:

"Taking all these groups as enumerated by the last census, it is plain that average steel hours including all departments, were substantially the same as average working hours for all Americans; and it is particularly plain that the 8-hour day was worked by a greater percentage of steelworkers than of all American workers and the 12-hour day by a considerable less percentage of steelworkers than by all American workers."

The origin of the plan to investigate the steel strike as part of the Interchurch World Movement as told by Mr. Olds is interesting and doubtless in some degree, significant. The resolution, the adoption of which led to the investigation of the steel industry was presented by John M. Glenn, director of the Russell Sage Foundation, at a meeting called by the Industrial Relations Department of the Interchurch World Movement at the Hotel Pennsylvania, New York City, Oct. 3, 1919. The purpose of this meeting of the Industrial Relations department was to consider industrial questions representative of employer, labor and public interest. The employer interest was poorly represented although invitations had been freely extended and the attendance was made up of a preponderance of representatives of labor and of the less conservative representatives of the public. Marking the sympathies of the meeting as constituted, a resolution condemning the steel companies for not accepting collective bargaining had been put and unanimously adopted before Mr. Glenn's motion for the investigation was presented. Later this vote was rescinded. Subsequently, the executive committee of the Interchurch World Movement appointed a special Commission of Inquiry which was to have direct charge of investigating the strike and the preparation of the report, of which Bishop Francis J. McConnell was chairman. In the foreword to Volume 2, the Interchurch report says that the commission, from its own records and investigators' reports, formulated the report of the steel strike. Furthermore, the commission declares that it holds itself responsible for the use of the investigators' reports in preparing the report on the steel strike.

(*Concluded on Page* 244)

Late News of the Societies

Notes on Past and Coming Meetings of National and Local Trade and Technical Organizations

RETIRING President Henry D. James of the Engineers' Society of Western Pennsylvania, who is manager of the control engineering department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, delivered an address on "Vertical Transportation" at the annual meeting of that organization held at the William Penn hotel, Tuesday, Jan. 16. The paper was illustrated by lantern slides and dealt with the elevator problem, indicating the improvements made in recent years in elevators for office buildings, hotels, etc., where large numbers of passengers are handled.

New officers for the ensuing year then were installed as follows: President, Morris Knowles, president, Morris Knowles, Inc., Pittsburgh, engineering and architectural work; vice president, W. B. Spellmier succeeding Frederic Crabtree of the Carnegie Institute of Technology, Pittsburgh and metallurgist of the Jones & Laughlin Steel Co., that city. Mr. Spellmier is local manager in charge of the Pittsburgh office of the General Electric Co. A. Stucki, engineer, was re-elected treasurer and K. F. Treschow was re-elected secretary. Two new directors were added to the board, namely Frank I. Ellis, consulting steelworks engineer, Pittsburgh, and E. D. Leland, assistant general manager of the Philadelphia Co., Pittsburgh.

It was announced that a large number of reservations have been received for the annual banquet to be held at the William Penn hotel Monday evening, Jan. 22 at 6:45 p.m. George H. Neilson, president and general manager of the Braeburn Steel Co., Braeburn, Pa., is to be toastmaster, and the new president, Mr. Knowles, will preside. Among the speakers will be Maj.-Gen. Sir A. C. MacDonell, K.C.B., C.M.G., D.S.O., commandant, Canadian Royal Military college, and who formerly was head of the Northwest mounted police; Charles Piez, president of the Link-Belt Co., Chicago, who formerly was director-general of the United States Shipping Board Emergency Fleet Corp., and T. S. Sisson, vice president of the Guaranty Trust Co., of New York.

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Philadelphia Foundrymen Elect

Frederick M. Devlin recently was elected president of the Philadelphia Foundrymen's association, succeeding his father, the late Thomas Devlin, who was head of the Thomas Devlin Mfg. Co., and who headed the Philadelphia Foundrymen's association for many years. C. R. Spare has been elected vice president. Other officers are: Treasurer, William G. Summers; secretary, Howard Evans; executive committee, Walter Wood, Frank Krug, Frank Hodson, Walter T. MacDonald, Williams S. Haney and J. Howard Sheeler.

* * *

Establishes Local Section

The American Society of Mechanical Engineers has approved the establishment of a local section of the society at Memphis, Tenn. Formation of the Memphis branch marks an important step in the expansion of the society's work in the South. The Memphis engineers are thus linked in a network of local sections extending from coast to coast and from Canada to Mexico. The society received the petition for the establishment of the Memphis section on Nov. 22, the organization committee initiating the petition having been formed in Memphis the preceding March.

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Chicago Foundrymen Elect

The Chicago Foundrymen, at the annual meeting held Jan. 13, enjoyed a smoker and social session, listened to reports of officers and elected officers and directors for the ensuing term. George E. Carlin, Carlin Foundry & Machine Co., LaPorte, Ind., was elected president, A. W. Gregg, Whiting Corp., Harvey, Ill., was made vice president and George H. Manlove, Chicago representative of IRON TRADE REVIEW, was re-elected secretary and treasurer. Directors for the next two years are as follows: Alex Dapogny, Chicago Steel Foundry, Chicago; E. A. Grindel, International Harvester Co., Chicago; E. G. Sherwin, Chicago Hardware Co., North Chicago; and C. B. Carter, Alloys Foundry Co., Chicago.

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Plan Engineering Museum

A joint committee on a national museum of engineering and industry in co-operation with the national museum of the Smithsonian institution, Washington, is formulating a plan for a great national museum of engineering and industry similar to those in foreign countries. The plan contemplates a central institution with local branches in different sections of the country having exchange facilities. The plan calls for use of museums already existing and others to be established according to requirements. The co-operation of the Federated American Engineering societies embracing the principal local engineering societies of the country, has been obtained. Clubs and leading industries are joining the movement. The members of the committee, appointed by the four founder engineering societies are as follows: Edward D. Adams and Charles L. Clarke, American Institute of Electrical Engineers, Frederic A. Delano and Dr. George F. Kunz, American Institute of Mining and Metallurgical Engineers, Clemens Hershel and Nelson P. Lewis, American Society of Civil Engineers, Reginal Pelham Bolton and Holbrook Fitz John Porter, American Society of Mechanical Engineers, the latter acting as chairman.

Convention Calendar

Feb. 14-16—American Institute of Electrical Engineers. Mid-winter convention, New York. F. L. Hutchinson, 29 West Thirty-ninth street, New York, is secretary.

Feb. 15-16—American Society for Steel Treating. Winter sectional meeting, City club, Chicago. W. H. Eiseman, 4600 Prospect avenue, Cleveland, is secretary.

Feb. 19-21—American Institute of Mining and Metallurgical Engineers. Annual meeting in Engineering Societies building, New York. F. F. Sharpless, 29 West Thirty-ninth street, New York, is secretary.

April 3-7—American Chemical society. Spring meeting New Haven, Conn. L. Parsons, P. O. Box 1515, Washington, is secretary.

April 18-20—Society of Industrial Engineers. Spring convention in Cincinnati. The headquarters of the society are at 327 S. La Salle street, Chicago.

April 25-27—National Foreign Trade Council. Annual convention in New Orleans. O. K. Davis, 1 Hanover square, New York, is secretary.

April 30-May 3—American Foundrymen's association. Annual convention and exhibition at Public Hall, Cleveland. C. E. Hoyt, 140 South Dearborn street, Chicago, is secretary.

May 3-5—American Electrochemical society, semiannual meeting, Hotel Commodore, New York. Colin G. Fink, 327 South La Salle street, Chicago, is secretary.

Engineers Meet in Washington

Problems of Engineering Societies Discussed at Meeting of American Engineering Council—Engineers Are Urged To Take Up Public Service—Elect Officers —New Italian Ambassador Speaks at Banquet

CREATION of a committee on industrial ideals, sponsoring a nation-wide movement to encourage colleges to train engineers for leadership in public service, was one of the outstanding accomplishments of the meeting of the American Engineering council of the Federated American Engineering societies in Washington last Thursday and Friday. Prof. Joseph W. Roe, of New York university, president of the Society of Industrial Engineers, was made chairman of this new committee. Other members selected are Dean Mortimer E. Cooley, of Ann Arbor, Mich.; Prof. C. F. Scott, of Yale university; and J. C. Ralston, of Spokane, Wash. The resolution setting up this new committee expresses these sentiments:

"For a century engineers have directed their energy toward the utilization of the physical forces and the materials of nature. The developments which they have brought about have created an epoch in human history. While these developments have been of inestimable benefit, and modern society could not exist without them, they have introduced many public problems and social readjustments, so closely related to the engineer's activities, that it is increasingly evident he must assume an active part in their solution.

"Recognizing this growing need, the engineers of the country formed the Federated American Engineering societies, primarily to place their knowledge and training at the public service on all public matters affecting engineering, or affected by it.

"Engineering education, reflecting closely the attitude of engineers heretofore has confined its work almost exclusively to scientific and technical training, giving little, if any attention to the social and human aspects of engineering enterprises. The American Engineering council therefore, speaking for the engineering profession, urges upon engineering colleges an increased attention to the social aspects of engineering activities, and a broadening of their technical training, in every way possible, to develop in engineering students the spirit of, and a capacity for, active leadership, not only in industry, but in public affairs."

John Lyle Harrington of Kansas City, president of the American Society of Mechanical Engineers, precipitated the most keen discussion of the two-day meeting when he proposed closer relations between the federated societies and the member bodies. A resolution by him, which was adopted in the following form after lengthy debate, reads as follows:

"Resolved, That it shall be the established policy of the Federated American Engineering societies to advise its member societies promptly and as fully as obligations of confidence will permit of the consideration or undertaking of all matters of material interest and to secure and obtain the advice and counsel of the member societies so far as that can be done without delay or detriment to the matters under consideration."

No words were minced by Mr. Harrington in insisting that the future of the federated societies depends upon the establishment of closer contact with the member societies. The present practice of apprising member societies after a matter has been disposed of is unsatisfactory, he declared. Mr. Harrington's proposal was declared by many ideal in principle but difficult in practice. The reference of matters to member bodies direct was termed by some to be overstepping the representatives of these societies. Officers of the body asserted that no efforts have been neglected to incite interest in the organization and not to act until interested societies, whether or not members, have been consulted. Mr. Harrington's resolution, however, prevailed in amended form.

A recommendation that the President select as the successor to Secretary of the Interior Fall, who has resigned as of March 4, a man with "the engineering type of mind" was adopted. Amendment and strengthening of the federal waterpower act also was urged. The patents committee of the council, of which Edwin J. Prindle, of New York, is chairman, submitted a report declaring that the present force of examiners and clerks in the patent office is inadequate to bring the work of the office up to date. The committee also recommended that congress name a joint commission to investigate the needs of the patent office, both as to personnel and physical equipment.

Dean Cooley, who has been president of the council in the past year, was re-elected. He is the second president of the council, Herbert Hoover, now secretary of commerce, having been the first. Dean Cooley now is rounding out his fortieth year of service for the University of Michigan. Calvert Townley, of the American Institute of Electrical Engineers, of New York, and Philip N. Moore, of the American Institute of Mining and Metallurgical Engineers, were made vice presidents, and Dr. H. E. Howe, of Washington, treasurer.

L. W. Wallace of Washington was re-elected executive secretary and James T. Grady of New York, publicity director. The next meeting of will be held in Cincinnati late in March. S. H. McCrory of the bureau the executive board of the Council of public roads, department of agriculture, was elected chairman of the finance committee. The new executive board of the council for 1923 follows:

Dean M. E. Cooley, University of Michigan; J. Parks Channing, New York; Calvert Townley, New York; Philip N. Moore, St. Louis; Gardner S. Williams, Ann Arbor, Mich.; C. G. Adsit, Atlanta; F. B. Jewett, William McClellan, L. F. Morehouse, L. P. Alford, New York; Prof. C. F. Scott, Yale university; G. M. Clevenger, Boston; Charles H. MacDowell, Chicago; Allen H. Rogers, Brookline, Mass.; Dean A. M. Greene Jr., Princeton university; John L. Harrington, Kansas City; Fred J. Miller, New York; Dean Perley F. Walker, University of Kansas; M. C. Lloyd, S. H. McCrory, Washington; Prof. Joseph W. Roe, New York university; A. E. Lindsu, Buffalo; W. H. Hoyt, Duluth; Charles R. Gow, Boston; W. J. Fisher, York, Pa.; Erskine Ramsey, Birmingham, Ala.; Lloyd A. Canfield, Des Moines; C. H. Koch, Dallas; J. C. Ralston, Spokane, Wash.; Dr. H. E. Howe, Washington.

At the annual banquet of the council the chief speaker was Prince Gelasio Gaetani, new ambassador to the United States from Italy. Other speakers were John J. Tiget, federal commissioner of education, and Calvin W. Rice of New York. Dean Cooley presided.

Prince Gaetani, himself an engineer, and for 13 years previous to the war a resident of the United States, said that his principal aim is to strengthen the bonds of friendship and esteem be-

(*Concluded on Page* 248)

See Little Danger of Coal Strike

Fact Finders in Preliminary Report Say Agreement Is Likely To Be Reached—Over Development at Root of Discord—Public Pays for Maintaining an Excess of 200,000 Miners and Families

WASHINGTON, Jan. 16.—In its preliminary report to congress on the coal industry, the federal coal fact-finding commission declares:

"Collective bargaining should rest upon reason, not force. An exhaustive investigation is to be made of the efforts of the union to organize non-union miners and of operators to thwart them.

"To expect the railroads to provide a 100 per cent car supply on the basis of present mine-ratings would create a car surplus or a coal surplus far beyond the ability of the market to absorb.

"There can be no permanent peace in the industry until overdevelopment, the underlying cause of instability, is removed.

"A determination of the reasonableness of transportation and marketing charges is of the utmost concern to consumers of coal.

"An indefinite repetition of the crises caused by strikes is intolerable and industry and the home must be freed from the menace of constant interruptions of their coal supply.

"An agreement seems likely to be reached between bituminous operators and miners and any widespread cessation of operations in the union bituminous fields on April 1 appears improbable."

Because of the shortness of time—the act creating the commission was only approved last Sept. 22 and the preliminary report was called for by Jan. 15—the commission refrains from recommendations. To date it has centered its attention on conversations with miners and operators and consumers in order to shorten the public hearings which will be inaugurated soon. The report states in part:

"In reality the coal industry includes three interrelated industries—mining, transportation and marketing. The coal mining industry, in point of numbers employed, outranks any single manufacturing industry and stands next to transportation and agriculture. Approximately three-quarters of a million men are employed in this industry, of whom 90 per cent work underground.

$2,300,000,000 *Invested*

"The capital invested, according to the rough figures of the census, is $2,330,000,000, of which $430,000,000 is invested in the anthracite and the remainder in the bituminous fields. There are only 174 producers of anthracite and eight of these control over 70 per cent of the annual output, while there are at least 6000 commercial producers of soft coal, to say nothing of thousands of wagon mines and country coal banks. These producers operate 9000 commercial mines.

"Each coal district, if not each mine, has its own local customs and problems, determined by the quality of coal, thickness of seam, attitude of the bed, conditions of mining, the markets which it can reach, its freight rates, its labor policy and other factors. In the matter of wage scales, even in the union districts where wage scales are determined by joint agreement, we find variations from district to district and from mine to mine. Still more difficult to summarize are the wage rates in nonunion mines. Not only are these wage rates complicated, but the opportunity to labor varies so greatly from field to field or mine to mine, depending on character of coal, nearness to the market, and commercial connections, that it is hazardous to make any generalization concerning miners' earnings.

"No less difficult under such conditions is the determination of average cost or profit. These subjects require specific and very detailed, painstaking investigation, which is complicated by the varying prices charged and received for the coal, quantity and quality both entering into the subject. The bituminous output is consumed approximately in the following percentages: Railroads, 28; industrials, 25; coking, 15; domestic, 10; iron and steel, 7; public utilities, 7; export, 4; mines, 2; and bunkers, 2.

"The coal industry does not end at the mine. Some 180 railroads take the coal at the mine mouth and transport it to thousands of destinations. Because the railroads are the largest customers of the bituminous industry, and because coal—anthracite and bituminous—constitutes one-third of the railroads' freight the problems of the two are closely interwoven and their interests interdependent. Not only does irregularity in coal output mean serious fluctuations in revenue but excessive irregularity imposes impossible traffic demands on the railroads. On the other hand, interference with rail transportation means a corresponding stoppage of output for the mines and shortage of fuel for the consumer. No solution of the coal problem can be found that does not recognize this community of interest between coal and transportation. But this community of interest, though simply stated, is not simple upon examination. The movement of coal by rail and water is complicated by variations in freight rates, arbitrary differentials, and competition between different coals and between carriers.

"Nor does the coal industry end with transportation. There are some hundreds of large wholesalers and a much greater number, perhaps 3500 in all, of smaller middlemen. Like the business of running mines, the business of selling has its problems and, like mining, it has also its abuses.

"The record of production and distribution of coal in recent years may be summed up in the word 'instability,' and this instability in the supply of one of the most fundamental of all raw materials has been an important cause in unsettling business and in delaying the return of normal times.

"It has been suggested to us that one of the causes of high prices of coal is profiteering. There has been profiteering in the sense that grossly exorbitant profits have been taken at times by many operators, brokers and retailers; profits that have been disproportionate to the cost of the coal or the service rendered or the risk incurred. But this commission has not yet obtained the figures for the past 10-year period specifically required by the act in order to settle this question. A thorough examination of the profits of production and distribution, including the revenue derived from associated enterprises, is already under way.

"Others attribute the instability in the coal industry to labor troubles. There can be no doubt that two of the three periods of high prices since 1916 have been caused largely by labor troubles. Whatever the cause or the merits of the labor controversy, it is clear than an indefinite repetition of these crises in the production and distribution of coal would be intolerable. Industry and the home alike must be freed from the menace of constant interruption of their coal supply.

Supplies Not Being Replenished

"Since the resumption of work, in August, 1922, after five months' cessation, more bituminous coal has been offered for shipment than the railroads have been able to carry, but only by investing money in a transportation system vastly in excess of reasonable requirements may the people of the country expect the railroads to make up within a few weeks the consequences of the five months' suspension of a large part of the coal mining.

"At the beginning of 1923 the bituminous coal industry presents to the country its usual contradictions. The one complaint common to most of the coal mining territory is that of 'car shortage;' yet the outstanding fact is that in spite of a miner's election day and the Christmas holidays, these coal mines produced in December, 1922, over 46,000,000 tons of soft coal. An actual shortage of anthracite has kept domestic consumers on the verge of a buyer's panic, restrained only by the co-operation of the larger coal operators with the federal and state fuel distributors, yet the 46,000,000 tons of soft coal was probably sufficient for the country's needs for current consumption, even in December, if evenly distributed. The fact that low coal reserves in the hands of the consumers are not being rapidly re-

plenished doubtless adds to the fear of scarcity, yet a full car supply for the country's soft coal mines, as rated by the railroads, would have furnished transportation in December for more than 75,000,000 tons or 20,000,000 tons more than the country ever took from the mines in a single month. Plainly, '100 per cent car supply,' as based on such inflated ratings, would create a car surplus or a coal surplus far beyond the ability of the market to absorb.

"Already in our study we have come to see that underlying these immediate causes of scarcity and high prices—labor difficulties and transportation deficiency—are other causes; namely, the irregularity of demand and the overdevelopment of the mining industry. These basic factors apply directly only to bituminous coal but indirectly they affect anthracite as well, for anthracite is in competition with bituminous coal and the wage scale in the one industry is influenced by changes in the other.

"We find that in the bituminous industry since 1890 the mines have averaged, over the country as a whole, only 213 days out of a possible working year of 308 days. These averages, of course, show nothing as to the relative annual earnings of individual miners or their individual opportunity to work. In 1920, a year of active demand, the average time worked was only 220 days, and in 1921, the year of depression it dropped to 149 days, with many districts showing a figure much below this average. Over a long period comparatively little of the time lost has been on account of strikes and that in the years when there are no strikes the aggregate time lost from all causes is about as great as in those when strikes occur. In the 23 years over which the statistical record of strikes extends, the time lost because of strikes has averaged nine days a year, or less than 10 per cent of the time lost for all causes combined.

"The other attributed cause, lack of transportation facilities during the annual peak of railroad business, commonly known as 'car shortage' enhances the cost to the consumer, but it does not explain the short working year for the miners. When the needed coal is supplied the miner gets it out at one time or another and his work takes so much time and no more. Short working time is the result of overdevelopment in the industry. There are more mines and more miners than the needs of the country require.

"The difference between 1910 and 1921 may be viewed by the consumer of bituminous coal somewhat as follows: The manufacturer who bought 10,000 tons of steam coal in 1910 paid for the year's labor of 131/3 mine workers, whereas if he bought the same amount of coal in 1921 he paid the wages of nearly 16 mine workers. This plainly is not progress, but the mistake must not be made of blaming the miner for a decreased output, for the average miner's daily output in 1921 was 41/5 tons, taking the 8000 commercial mines, large and small, in the United States, and in 1910 his daily output was about 3½ tons, although this difference is attributable in part to the increased use of mechanics. But in 1910 the average bituminous coal mine was operating 217 days as against 149 days in 1920.

"This condition of overdevelopment in mines and of surplus number of miners is an underlying cause of the instability of the industry. It means unemployment and intermittent employment to the coal miner and a direct loss to him of earning power. It explains his need and demand for a day wage rate higher than the average for most other industries. It has also adversely affected the profits of the operator and imposed a burden on the consumer.

"The seasonal character of coal movement is a serious handicap to the railroads in those districts where it is the rule. If the peak demands of the mines are to be met the carrier must provide equipment for which there is no use in the off-season.

"As for the public, the cost of maintaining an overdeveloped industry is reflected in the high price of coal. We do not know accurately the extent of burden, but it may well be measured by the cost of keeping in the industry an excess of perhaps 200,000 miners and their families and the excess investment in mines.

"A preliminary survey indicates that much can be done to overcome irregular demand by encouraging the storage of coal, and the commission cannot stress too strongly the great advantage of coal storage during the spring and summer for fall and winter use. This recommendation should apply to all consumers of coal—the railroads, the public utilities, the industries, and the home—and on the measure in which it may be adopted will largely depend the evenness of distribution and the cost of coal to the public during the season of heavy consumption."

Refute Interchurch Report

(*Concluded from Page 240*)

Heber Blankenhorn, as stated in the second volume of the Interchurch report, was in charge of the field investigation and investigators. Mr. Blankenhorn's record as given by the author is shown to be that of an effective propagandist during the war and to have been closely identified with a school of radicals in New York. The writing of the report largely is ascribed to him. The public record of several other leading members of the investigating committee is quoted to show their radical sympathies.

The Interchurch report says "The statements and affidavits of 500 steelworkers carefully compiled and attested constitute the rock-bottom of the findings." The author declares it is hardly possible under any circumstances that 500 men could represent the point of view of 500,000. Furthermore, it is admitted in the report that the affidavits were largely composed or phrased by its own investigators or by James R. Maurer, president of the Pennsylvania Federation of Labor and widely known for his radical views.

In this connection Mr. Olds dismisses as absurd the probability that the nine prominent Christan leaders opposing the commission of inquiry would have deliberately falsified and twisted the testimony; could have within a few weeks become so intimately acquainted with the philosophies of the various radical schools and their technical phraseology; or could have acquired a vast variety of highly specialized technical knowledge pertaining to industry, all of which the report embraces.

The only other acceptable conclusion to be drawn from the facts adduced by the analysis, says Mr. Olds, is that the commission of inquiry out of confidence in its "technical assistants" accepted at its face value the evidence either prepared or brought to its attention by the latter and that it easily accepted the conclusion substantially as one of the investigators, Blankenhorn, stated them in the reports; furthermore, that the directors and other members of the Interchurch World Movement in approving the Interchurch report also took the evidence at its face value because of confidence in the Commission of Inquiry. Therefore, the author concludes that *"irrespective of what the commissioners of inquiry may honestly believe the whole investigation and report far from being actually the product of conscientious Christian thinking was the result of flagrant manipulation of circumstances and evidence of the commission's radical technical advisors and assistants and investigators."*

A careful examination of the analysis, with due regard to the painstaking and penetrating character of the author's presentation both of facts and argument, must be wholly convincing to those interested only in the truth that he has proved beyond doubt the fatal and deliberate partisanship of the Interchurch report; the false or inadequate premises upon which its arguments and conclusions were raised; and its complete worthlessness as a guide to enlightened public opinion.

In doing so Mr. Olds has performed skillfully and manifestly with great perseverance, a service almost beyond immediate calculable value, and of lasting benefit, not so much to the steel industry itself as to the general public and the nation as a whole.

Purchases Metals Plant

The Electro-Metallurgical Co., New York, has purchased the Electro-Metals, Ltd., Welland, Ont., which will be known henceforth as the Electro-Metallurgical Co. of Canada. The Welland plant manufactures ferrosilicon and other ferroalloys and electrodes. Imports of ferrosilicon produced at the Welland works were an important factor in the American market during a large part of 1922 prior to the new tariff.

Obituaries

DR. NELSON POWELL HULST of Milwaukee, discoverer of the Menominee iron range in Michigan and Wisconsin, and for many years in charge of the ore mining interests of the United States Steel Corp., died at his home in Milwaukee on Jan. 11, at the age of 81. Dr. Hulst was graduated with the degree of doctor of philosophy from Yale in 1867 and went to Milwaukee in 1870 to join the old Milwaukee Iron Co., forerunner of the present Bay View mills of the Illinois Steel Co. Shortly afterward he started explorations in the district now known as the Menominee range and opened the Pewabic mine in 1876. He was one of the pioneers of iron mining in the Lake Superior district, and conducted extensive exploration work on the Mesabi range. He retired from active business in 1905, but until his death retained the position of vice president of the Milwaukee Gas Light Co. and director of the Pewabic Iron Co. and the Reymert Land Co. Dr. Hulst was a member of many national and international societies of mining engineers, the various iron and steel, and scientific societies. His son, Harry T. Hulst, is now chief engineer of the Oliver Mining Co. at Ishpeming, Mich.

Albert Kretlow, purchasing agent of the Great Lakes Engineering Works, Detroit, died recently at Ford General hospital after a week's illness. He was a director of the Purchasing Agents' Association of Detroit. He was 45 years old.

James T. Goodwin, for many years a mechanical expert with the National Tube Co. and for the past 12 years connected with the New York sales office of that company, died Jan. 6 at a hospital in New York following an illness of two weeks. He was 62 years of age.

Gordon Sands Falk, chief engineer of the Falk Corp., Milwaukee, died recently from the effects of an operation for appendicitis. He was born in Milwaukee in 1887 and in 1910 graduated from the University of Wisconsin as a mechanical engineer. He was a member of the American Society of Mechanical Engineers.

Frank W. Howard, aged 42, vice president of the Enamel Metals Co., Pittsburgh, died recently in his home, 306 South Linden avenue. He was born in Wellsburg, W. Va., and had resided in Pittsburgh since 1905. He was a graduate of the University of Pennsylvania, and was a member of the University, Union, Pittsburgh Field, Pittsburgh Country and the Pittsburgh Athletic clubs, and several Masonic bodies. He was a member of the Phi Kappa Psi collegiate fraternity.

John A. Roe, aged 68, vice president and general sales manager of the Pittsburgh Stove & Range Co., Pittsburgh, died recently in his home in Coraopolis Heights, Pa. He was one of the best-known stove manufacturers in western Pennsylvania. Mr. Roe was born in old Allegheny and had resided in and near Pittsburgh most of his life. He was a member of the firm of De Haven & Co. of the North Side until it was merged into the Pittsburgh Stove & Range Co., and was organizer of the Pennsylvania Stove Co. at Ellwood City, Pa.

A. B. LANDIS

William H. Moore, a leading corporation lawyer, who with his brother James H. Moore was one of the organizers of the American Tin Plate Co., the National Steel Co., the American Sheet Steel Co., and the American Steel Hoop Co., the four organizations which were among the first to be acquired by the Morgan interests in forming the United States Steel Corp., died Jan. 11 at his home in New York of heart disease. He had been ill for the past three months. Mr. Moore was 74 years old and a native of Utica, N. Y. In addition to forming the companies named, he was an organizer of the American Can Co., and several other large industrial projects, including the Diamond Match Co. He also was interested in the Delaware, Lackawanna & Western and the Rock Island railroads, as well as the American Surety Co. His first education was obtained in a seminary at Oneida, N. Y., and after completing his studies at Cortland academy at Homer, N. Y., he entered Amherst college, from which he was graduated in 1872. Aside from his legal work Mr. Moore was known internationally as a breeder and exhibitor of fine horses. He was a member of the United States Chamber of Commerce and various clubs.

A. B. Landis, for many years an official of the Landis Tool Co. and the Landis Machine Co., both of Waynesboro, Pa., recently died following an attack of heart disease. He was born in 1854 and learned his trade as a machinist in the shops of Frank F. and Ezra F. Landis, Lancaster, Pa. In 1874 he became a partner with his brother in the firm of F. F. & A. B. Landis, manufacturing small stationary engines, etc. In 1878 this business was sold to the Geiser Mfg. Co., Waynesboro, Pa., where Mr. Landis was in charge of the tool department for a number of years. During his connection with this company Mr. Landis developed the first Landis grinding machine. In 1890 he formed a partnership with his brother Frank F., under the firm name of Landis Bros., for the manufacture of cylindrical grinding machines. The company's plant was destroyed by fire in 1897 but shortly thereafter the Landis Tool Co. was organized. In 1903 the Landis Machine Co. was organized to manufacture threading machines which he had developed. In 1910 he severed his connections with both companies and opened an engineering laboratory at Chestnut Hill, Philadelphia, where he developed many inventions, chief among which was a mechanical speed change mechanism for automobiles, machine tools, etc. In the fall of 1919 he organized the firm of A. B. Landis & Sons to engage in commercial grinding and the development of his mechanical ideas. He was actively connected with this latter business until the time of his death.

Trumbull Steel Capital To Be Reorganized

Reorganization of the capital structure of Trumbull Steel Co., Warren, O., is recommended by President Jonathan Warner and directors to stockholders who will hold their annual meeting Feb. 6. The reorganization is proposed under the no par value stock law of Ohio and will consist of the authorizing of 1,500,000 shares of no par value common stock and $15,000,000 7 per cent cumulative preferred stock. The no par value stock is to be exchanged for the present $25 par value stock share for share and the present preferred stock is to be exchanged for the new preferred share for share. Directors also ask authority to set aside 100,000 shares of the new stock for sale to employes.

The Trumbull Steel Co. at present has an authorized capital of $10,000,000 preferred, all outstanding, and $25,000,000 common of which about $14,000,000, or 560,000 shares are outstanding. It is proposed that from the increased preferred issue about $1,000,000 be exchanged for the outstanding Liberty Steel Co. preferred stock. This company was bought by the Trumbull company about three years ago and it is now proposed to terminate its corporate existence.

Mr. Warner said that the Trumbull company "broke better than even in 1922," having earned all preferred and common dividends, taxes and depreciation during the year and showing a small balance for surplus.

Bridge Profits Decline

The annual report of the Dominion Bridge Co., Ltd., Montreal, Que., for the 12 months ended Oct. 31, 1922, shows profits of $188,670 as compared with $513,000 in 1921 and $1,092,123 in 1920. After allowance of $134,008 for depreciation, net earnings are left at $54,661 as compared with $378,693 for 1921. The distribution of dividends on the 4 per cent amounting to $260,000, created a deficit of $205,339 as compared with a deficit of $141,307 in 1921, after payment of dividends on the 8 per cent basis and a balance of $444,530 in 1920.

Hoover Co. Reorganized

Reorganization of the Hoover Suction Sweeper Co. as the Hoover Co., with plants at Canton, O., North Canton, O., and Hamilton, Ont., is announced. The company now will engage in the manufacture of household labor saving devices but for the present does not contemplate any expansion or extension of its plants or facilities . The company has been recapitalized with $3,000,000 preferred and $2,000,000 common stock. Officers are: Chairman, W. H. Hoover; president and general manager, H. W. Hoover; first vice president an dassistant general manager, F. G. Hoover; second vice president, director of advertising and chief engineer, H. Earl Hoover; and secretary and treasurer, H. C. Price.

Ford To Spend Millions

Detroit, Jan. 15.—Development of the plant of the Ford Motor Co., at Fort, Ont., will entail an expenditure of between $8,000,000 and $9,000,000, in the next 12 months, declares Wallace R. Campbell, vice president of the institution. Former plans called for an outlay of between $3,000,000 and $4,000,000 to be spread over three years, said Mr. Campbell, but owing to the necessity of developing British Empire trade the work is to be rushed to completion and the main building now under construction will be completed by May 15, this year. Mr. Campbell said the production schedule of the Canadian plant will be materially increased this year.

Officers Are Chosen by M. A. Hanna Co.

The M. A. Hanna Co., which recently was organized as an Ohio corporation to conduct the business heretofore carried on as a partnership, announces the election of the following officers: M. Andrews, chairman of the board; H. M. Hanna Jr., president; F. B. Richards, William Collins, R. F. Grant, L. C. Hanna Jr., and G. M. Humphrey, vice presidents; C. N. Osborne, secretary and treasurer; S. W. Folsom and C. W. Brown, assistant treasurers; W. C. Scott, assistant secretary, and L. R. Close, comptroller. Following are the directors: M. Andrews, H. E. Booth, William Collins, Michael Gallagher, R. F. Grant, H. M. Hanna Jr., L. C. Hanna Jr, C. N. Hickok, G. M. Humphrey, R. E. McMahon and F. B. Richards.

Bonds Supplement Wages

The General Electric Co. has announced that supplementary compensation equal to 5 per cent of the earnings for the six months ending Dec. 31, will be paid on or about Feb. 1 to each employe receiving $4000 or less per year, who completed five years of continuous service at the close of the year. The payments will be made to employes in one year, 7 per cent investment bonds, in $10 units or multiples thereof, the balance, if any, to be paid in cash.

Improvement Noted

In Production of Coke By-Products—Solvent Naphtha and Phenol Scarce

New York, Jan. 16.—Production of coal tar by-products continues to improve but as demand for industrial light oil distillates shows little increase, the output is going largely into motor fuel. Solvent naphtha and toluol, remain scarce for this reason as inquiry for these products is not heavy and this shortage is expected to prevail until there is a considerably heavier demand in the market for pure benzol.

Quotations on light oil distillates continues steady. Pure benzol, 27 cents in tanks and 33 cents in drums; toluol, 30 cents in tanks and 35 cents in drums; solvent naphtha 27 cents in tanks and 32 cents in drums; pure xylol, 30 cents in tanks and 35 cents in drums, and commercial xylol, 26 cents in tanks and 34 cents in drums.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producres' Plants

Phenol	$0.24
Naphthalene, flake	0.06 to 0.07
Naphthalene, balls	0.07 to 0.08

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.10

Contract

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene, flake	0.06 to 0.07
Naphthalene, balls	0.07 to 0.08

The market on phenol is holding at its recently advanced level of 24 cents, producers' plants. Supplies of phenol are scarce. No change is reported in naphthalene, flakes being quoted 6 to 7 cents, f.o.b. works and balls, 7 to 8 cents.

Slight improvement in foreign demand for sulphate of ammonia a few days ago has proved to be but a flurry, the foreign market again being quiet. Prices on foreign shipments are nominally $3.45 to $3.50, port, in double bags. At the same time, sulphate of ammonia is being bought slowly by domestic-consumers, the prevailing prices at the present time being $3.10 and $3.15 works.

A slightly encouraging feature, however, is the fact that domestic consumers are manifesting more interest in the shipment of such material as they have already placed on order.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

JAMES ABERCROMBIE BURDEN, who was elected president of the Eastern Steel Co., as noted in the Jan. 11 issue of IRON TRADE REVIEW, has been vice president and chairman of the company and had been acting head of it since Veryl Preston resigned the presidency some years ago. Mr. Burden also is president of the Burden Iron Co., Troy, N. Y. He was born in New York city in 1871, was educated at Cutler's school, New York, and graduated from Harvard in 1893. Upon leaving college he joined the Burden Iron Co., and in 1894 became a director. He became vice president in 1900 and in 1906 was elected president to succeed his father. In addition to heading the Burden Iron Co. and the Eastern Steel Co., he is a director of the O'Rourke Engineering Construction Co., the Port Henry Iron Ore Co., the Windsor Trust Co. of New York and the United National Bank of Troy. He is a member of the American Iron and Steel institute, the National Academy of Science, a director of the association of Harvard Engineers and of various other social societies.

E. B. Germain has resigned as manager of sales in the New York district for the Bethlehem Shipbuilding Corp.

L. J. Gibbons, previously connected with the Maher Engineering Co., now is associated with the Chicago office of the Standard Turbine Corp.

E. M. Herr, president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been elected president of the East Boroughs council of the Boy Scouts of America.

J. Leonard Replogle, chairman of the American Vanadium Co., and the Replogle Steel Co., has gone to Palm Beach, Fla., for a vacation of several weeks.

Gen. George W. Goethals has been appointed New York state fuel administrator, succeeding William H. Woodin, president of the American Car & Foundry Co., who resigned the office recently.

C. F. Blue Jr., has resigned as president and director of the Carbon Steel Co., Pittsburgh, effective Jan. 8. W. W. Noble has resigned as secretary, director and manager of sales of the company.

Sir Vincent L. Raven has joined the board of directors of the Metropolitan-Vickers Electrical Co., Manchester, formerly the British Westinghouse Co. Until recently he was associated with the North Eastern railway as chief mechanical engineer.

C. J. Nieman, secretary and treasurer, and L. W. Hicks, vice president of the Penn Iron & Steel Co., Creighton, Pa., plan to leave for South America Jan. 24, on an extended business tour. Their itinerary includes Havana, Panama, Valparaiso and Rio de Janeiro.

Hamilton Stewart, vice president of the Harbison-Walker Refractories Co., Pittsburgh, was elected recently to the directorate of the Union National bank, Pittsburgh, succeeding Harry Darlington, resigned. Mr. Stewart is a director of the Crucible Steel Co. of America, the Crucible Steel Co. of Pittsburgh, the Baragua Sugar Co. and the Koppers Co.

H. A. Hutchins, formerly connected with the Thew Shovel Co., Lorain, O., has become associated with the main office staff of the Northwest Engineering Co., Detroit. Mr. Hutchins has been with the sales staff of the Thew company since 1917 and was district manager in the Chicago territory for that company up until the time he joined the Northwest organization.

Paul Norton, president of the Case Crane & Engineering Co., has been named president of the Kilbourne-Jacobs Mfg. Co., Columbus, O., which recently was reorganized. Howard Hileman was elected vice president of the company; Clyde Roth, secretary-treasurer; D. H. Bach, auditor and H. W. Finnell, vice president in charge of the sales department.

Frank Walker, superintendent of the bessemer department of the Republic Iron & Steel Co., Youngstown, O., has resigned to become operating head of the new mechancial puddling plant of the Youngstown Steel Co., now in the course of construction near Warren, O. Joseph Welsh has been appointed to Mr. Walker's place, while Frank Cunningham has been made general superintendent of both the bessemer and Brown Bonnell mills of the Republic company.

Samuel V. Hunnings, for some years metallurgical superintendent of the Washington Steel & Ordnance Co., Washington, and previous to that metallurgical engineer of the American Locomotive Co., has been elected president of the Weldless Rolled Ring Co., Cleveland, which was recently organized. C. C. Venable, for a number of years mechanical engineer with the Washington company, has been appointed chief engineer for the new company.

J. A. Hager has been appointed Chicago district sales manager of the Columbus-McKinnon Chain Co., covering Illinois, Wisconsin, Minnesota, North Dakota and Nebraska. His headquarters will be at 1504 Fisher building, Chicago. Mr. Hager is well known in the steel industry, formerly being connected with the Rail Joint Co., Chicago, and the Lackawanna Steel Co., serving the latter company from January, 1911, to October, 1922, as sales manager in the Buffalo district.

Capt. E. V. Wetzell has been placed in charge of the sales department of the Giddings & Lewis Tool Co., Fond du Lac, Wis. Mr. Wetzell became connected with the Norton Co., Worcester, Mass., 19 years ago, and for several years was with the Modern Tool Co., entering the army in 1917 and going to France in charge of all grinding machinery. Upon his return he joined the Cincinnati Grinder Co., resigning to become general sales manager of the Giddings & Lewis Tool Co.

Charles M. Schwab has accepted the chairmanship of a committee of New York business men being formed to enlist support and co-operation of all the trades in the work of the Arbitration Society of America and of developing citywide activities which will help to relieve the present congested conditions of court calendars. It is hoped that by encouraging business men to arbitrate their differences a great deal of court litigation may be avoided.

E. J. Kulas, president of the Crouse-

Tremaine-Kulas Co., has been made president and general manager of the Parish & Bingham Corp. Cleveland, succeeding Mrs. Agnes D. Morse, resigned. For 15 years he had been connected with the General Electric Co. At the outset of the war he with two associates organized the Cuyahoga Stamping & Machine Co., Cleveland, which manufactured cartridge cases for the United States and Italian governments. He also was an organizer of the Federal Nut & Bolt Co. and the Federal Gear Co. The change became effective Jan. 1.

H. R. Atwater, vice president of the Osborn Mfg. Co., Cleveland, has resigned as sales manager of the machine division of that company and is succeeded in this position by M. W. Zeman. Mr. Atwater having suffered from ill health for more than a year decided to give up the work of sales manager and went to California to live. Here he will look after the company's molding machine interest on the Pacific Coast, having retained the position as vice president of the company. Mr. Atwater came with the Osborn Mfg. Co. in October, 1893 from another line of business. He has had a large part in the development of the company's line of molding machines. From the time the company started to manufacture such equipment he has been at the head of the machine sales department. A recent letter from Mr. Atwater advises his health is decidedly improved since his removal to California.

M. W. Zeman has been promoted from the position of European sales director of the Osborn company, to the position of sales manager of the machine division of the company, succeeding Mr. Atwater. Mr. Zeman has had marked success in his European work. Mr. Zeman took up the introduction of company's molding machines in Europe in 1919 making his headquarters in Paris. He began his business career with the Dean Electric Co., Elyria, O., where for five and one-half years he worked from a junior position in the drafting room up to that of assistant chief engineer. He left the Dean company and took a position with the American Multigraph Co., Cleveland. Later he was given charge of drafting room, tool room, and finally was at the head of manufacturing. He started with the Osborn Mfg. Co. in 1912. Since beginning his business career, Mr. Zeman completed courses in mechanical and electrical engineering, and has given two years of evening study to pattern making and two years to machine shop practice.

Professor Thomas M. Bains has been appointed assistant professor of mining engineering at the University of Illinois. He will have charge of the coal washing and ore dressing laboratory.

Otis C. Friend has been appointed vice president of the Lavine Gear Co., Milwaukee, in charge of passenger car manufacturers' sales. Mr. Friend formerly was president of the Mitchell Motor Car Co., Racine, Wis.

L. W. Francis, president, Witherbee-Sherman Co., Inc., New York, was elected president of the Eastern Pig Iron association for the ensuing year at the recent annual meeting in New York. W. S. Pilling, Pilling & Crane, Philadelphia, was re-elected secretary.

George A. Ray has been elected president of the New England Foundrymen's association. He was born in Providence, R. I., in 1875. When he was 13 years old he entered the employ of the Brown & Sharpe Mfg. Co., where after serving for 17 years he left to accept a position as foundry foreman with the Phoenix Iron Foundry Co., Hartford, Conn. Later he became superintendent and a year ago was elected vice president and director of the company, which now is known as the Taylor & Fenn Co. Mr. Ray also is a member of the American Foundrymen's association.

E. M. Rhoads has disposed of his interests and resigned as president and treasurer of the Sanitary Co. of America, Linfield, Pa. With other associates of the company he has formed the Eastern Foundry Co., Boyertown, Pa., which will specialize in the production of cast iron soil pipe, soil fittings and iron plumbing specialties. The personnel of the Eastern organization will include E. M. Rhoads, president and treasurer; B. W. Frederick, vice president; Grant P. Bechtel, secretary and assistant treasurer; and Daniel G. Burkert, assistant secretary and purchasing agent. Harry R. Trout, for the past 10 years general superintendent of the Sanitary company of America, will be general superintendent.

Charles G. Washburn, president of the Washburn Co., Worcester, Mass., has been made chairman of the committee which will supervise the erection of a memorial to Theodore Roosevelt at Harvard university.

Edward T. Fowler president of the Foster Machine Co., Westfield, Mass., is recovering from an operation in Johns Hopkins hospital, Baltimore.

James H. Hammond has been made president of the Superior Steel Corp., Pittsburgh, succeeding E. W. Harrison, resigned. C. H. Forster now is treasurer, having resigned the vice-presidency. C. B. Claney has resigned as treasurer but has been elected secretary. The position of vice president so far has not been filled.

David Gessner, president and general manager of the David Gessner Co., Worcester, Mass., builder of machinery, has returned from a trip to Germany.

Fred H. Daniels, general manager of the Sanford Riley Stoker Co., Ltd., Worcester, Mass., has been elected a director of the Mechanics National bank of that city.

F. E. Allen, who for the past 12 years has represented the Cambria Steel Co. and Midvale Steel & Ordnance Co. in Buffalo, resigned recently to enter business for himself as steel manufacturers' representative with offices at 27 Colvin street, Buffalo.

Dr. Ira N. Hollis, president of Worcester Polytechnic Institute, Worcester, Mass., has resigned from the council of the American Society of Mechanical Engineers after six years' service, during one of which he served as president of the society. He is succeeded in the council by Dean Dexter S. Kimball of Cornell university. E. Howard Reed of Worcester has been appointed on the committee of meetings and program of the society, to serve five years. George A. Orrol of New York has been nominated to fill the unexpired term ending June 30, 1923, on the National Research Council of Dr. D. S. Jacobus, who resigned. Fred J. Miller has been re-elected as the society's representative on the John Fritz medal board of award.

Engineering Council Meets

(*Concluded from Page* 242)

tween this country and Italy. Recalling his engineering career in the West following his graduation from the Columbia University School of Mines in 1903, Prince Gaetani said that he was returning not only as a diplomat but as an engineer and friend of America.

Engineering, he continued, was destined to play a powerful role in modern civilization. Italy he described as a nation born again. Its potentialities industrially, he said, were bound to make it a great force in world commerce. The electric industry especially was making rapid strides and all branches of engineering activity were developing constructive effort, in which Italy's greatest asset was an abundance of efficient labor and in which American capital and machinery were needed.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

OPERATIONS have been started by the Valls Engineering Co., in the plant of the Buckeye Drill & Lathe Co., Marion road, Columbus, O., building hoisting and conveying machinery. The company is paying particular attention to special designs where standard equipment will not apply. Included in recent work done by the company has been the designing of several special wharf and dock cranes for river service. A feature of these cranes is that they will move up and down the bank of the river with the fluctuating volume of water. The operating personnel of the company consists of R. W. Valls, who for many years has been chief engineer, consulting engineer and manager of several plants building hoisting equipment, and W. L. Lloyd, who is in charge of sales. Mr. Lloyd has been engaged in this line of work for more than 30 years, both as a manufacturer and sales engineer.

* * *

AMERICAN Abrasive Co., Westfield, Mass., held its annual meeting recently when these officers were elected: President, Louis M. Fuller; vice president, E. A. Scheibe; treasurer, Harry E. Willcut; secretary, H. B. Putnam; directors, the officers and George L. Gaylord.

* * *

THE Northern Corrugating Co., Green Bay, Wis., moved into a large shop addition over the holidays and now is working at an increase of about 50 per cent in capacity. The company is engaged in making galvanized cornices, roofing, ceilings, etc. H. W. Krueger is president of the company.

* * *

THE Chapman Machine Co., Terryville, Conn., elected the following officers at its recent annual meeting: President and treasurer, Clarence M. Chapman; vice president, Adelard Riendeau; secretary, Noble E. Pierce; directors, the officers and Matthew F. Hayes, John J. Conlon and Max Hotkoski. The company is operating overtime.

* * *

PHILLIPS & Butterff Mfg. Co., Nashville, Tenn., is about ready to break ground for the erection of an additional building at its foundry. This structure, which will be three stories, 100 x 127 feet will be used as a factory building and warehouse. The first floor will be utilized to assemble and ship hot air furnaces, while the second floor will be used for storage. The third floor will house the electric plating department.

* * *

THE Springfield Body Corp. recently was incorporated in New Jersey with 100,000 shares of no par value to take over the Smith-Springfield Body Corp., Springfield, Mass. Negotiations are under way for the taking over of the New Jersey plant of the General Motors Corp. and another large plant in Michigan. It is understood the new organization will start business with orders for more than $2,500,000 of automobile bodies.

* * *

FOR the purpose of obtaining additional capital to finance the erection of a plant addition, the Brantford Brass Foundry, Ltd., Brantford, Ont., recently was incorporated with an authorized capitalization of $100,000. Officers of the company are: President, D. L. Webster; vice president, A. Serjeant and secretary-treasurer, T. E. Hutton. These men with Henry William Bennett and Donald A. Hutton, compose the board of directors.

* * *

CAPITAL stock of the Aluminum Specialty Co., Manitowoc, Wis., has been increased from $250,000 to $600,000 and at the same time contracts let for the construction of a 3-story factory addition, 52 x 150 feet. It is expected to be ready for occupancy about April 1. The present plant of the company is operating to capacity, as is its branch plant at Chilton, Wis. Walter Spindler is president of the company, Charles Krug, vice president and A. J. Kempfert, secretary-treasurer.

* * *

LACK of adequate working capital having made it necessary for the Biggam Trailer Co. of Racine, Wis., to effect a financial reorganization, L. E. Pitner, secretary, has been appointed receiver by the circuit court at Racine. The company was originally incorporated at Milwaukee with $265,000 capital stock and moved to Racine about a year ago. It manufactures trailers and trailer trucks on its own account and for motor truck manufacturers. H. F. Biggam is president and general manager.

* * * *

BATH Iron Works, Ltd., Bath, Me., builder of steel ships, elected the following officers at its recent annual meeting: President, William T. Cobb, Rockland, Me.; treasurer, William A. Furber; clerk, Joseph M. Trott; directors, Maynard S. Bird, Hugh J. Chisholm, H. M. Verrill, Henry Lewis and Edward W. Cox, all of Portland, Me.; F. H. Appleton and Henry W. Cushman, both of Bangor, Me.; William T. Cobb; Charles P. Wetherbee and William S. Newell, both of Bath.

* * *

MANUFACTURE of power hammers and special tools for machine shops, especially automobile plants and garages, will be started at once by the Hammer Blow Tool Co. of Wausau, Wis., a new corporation with $100,000 capital stock, organized by Thomas H. Jacob and associates. The company has purchased the Danielson Tool Co. of Wausau, which for four years has been making automobile shop tools, and will remodel and enlarge this plant, continuing the original line and adding heavier machinery.

* * *

RING gear blanks and bearing rings as well as spinning rings used in textile machinery, will be manufactured by the Weldless Rolled Ring Co., in a plant at 10022-26 Detroit avenue, Cleveland, which it has just leased. Machinery now is being installed and it is expected production will be started about Feb. 1. It is understood the company is the outgrowth of the Washington Steel & Ordnance Co., which handled large government contracts during the war. Officers of the company are President, S. V. Hunnings; secretary-treasurer, A. R. Marsh; chief engineer, C. C. Venable. These men with Cleveland R. Cross and A. L. Alexander compose the board of directors.

Sheet and Tin Mill Wages Again Are Advanced

Youngstown, O., Jan. 16.—The average sales price of 26, 27 and 28 gage black sheets was found to have been 3.30c, and that of a base box of tin $4.70 in November and December, at the bi-monthly sheet and tin wage settlement Jan. 11.

As a result of the settlement, sheet workers' wages are advanced two points or 3 per cent, to 34½ per cent above base as compared with 31½ per cent above base in the last period. Wages of tin workers are advanced 1 per cent to 24 per cent above bass.

While the wages of sheet workers have been advancing steadily since a year ago when the low point was reached, wages of tin workers show the first slight advance from the bottom reached in May, 1922. Following are the average selling prices on which wages for the respective periods were based.

January-February	3.30c	+ 3	per cent
November-December	3.20	+ 4½	per cent
September-October	3.05	+ 4½	per cent
July-August	2.90	+ 3	per cent
May-June	2.80		unchanged
March-April	2.80		unchanged
January-February, 1922	2.80	+ 1½	per cent
November-December	2.75	—10½	per cent
September-October	3.10	—15	per cent
July-August	3.85	— 3	per cent
May-June	3.95	—10½	per cent
March-April	4.30	—25½	per cent
January-February, 1921	5.15	—19½	per cent

Signs Wage Agreement

The Erie railroad and its subsidiaries have signed a new wage agreement with the federated shop craft unions extending the wage rates authorized by the United States railroad labor board, and union recognition and working conditions, to their 20,000 shopmen. The new contract runs until Nov. 1 and after that date is subject to cancellation by either party on 30 days' notice. In addition to restoring full seniority and other privileges to workers who went on strike last July, the agreement provides for back pay for the 8000 to 10,000 shopmen who have been receiving less than the railroad labor board minimum of 70 cents an hour since they returned to work last October.

Negotiations with their shopmen now are under way by the Lackawanna and Lehigh Valley railroads. It also is reported that the Central Railroad of New Jersey soon may begin negotiations with its employes.

As a New Year's gift, the Osgood Bradley Car Co., Worcester, Mass., has given its salaried employes who have been with it a year or longer a bonus of one-half of their salary for November, plus 5 per cent of the month's salary for each year of continuous service.

Living Costs Compared

(Percentage over July, 1914)

July, 1914 to	All items	Food	Shelter	Clothing	Fuel and light	Sundries
Jan., 1920	90.2	97	43	170	49	77
Feb., 1920	93.5	101	45	177	49	78
Mar., 1920	94.8	100	49	177	49	83
Apr., 1920	96.6	100	50	188	51	83
May, 1920	101.6	111	51	187	55	83
June, 1920	103.0	115	51	176	61	85
July, 1920	104.5	119	58	166	66	85
Aug., 1920	103.2	119	58	155	69	85
Sept., 1920	99.4	107	59	155	78	88
Oct., 1920	97.3	103	59	148	83	90
Nov., 1920	93.1	93	66	128	100	92
Dec., 1920	90.0	93	66	105	100	92
Jan., 1921	81.2	78	66	87	100	92
Feb., 1921	76.3	72	66	74	98	90
Mar., 1921	68.7	56	71	74	87	85
Apr., 1921	67.6	56	71	69	79	85
May, 1921	65.7	52	71	68	78	85
June, 1921	61.9	45	71	62	78	85
July, 1921	63.1	48	69	64	79	85
Aug., 1921	62.0	48	69	59	79	83
Sept., 1921	64.8	55	69	57	79	83
Oct., 1921	63.7	53	69	60	79	80
Nov., 1921	63.0	[illegible]	69	61	79	78
Dec., 1921	62.7	52	69	57	79	78
Jan., 1922	61.4	50	69	56	78	78
Feb., 1922	57.7	42	69	56	77	77
Mar., 1922	54.7	39	65	56	74	74
Apr., 1922	54.8	39	65	55	74	74
May, 1922	54.9	39	65	56	74	74
June, 1922	55.4	41	65	53	74	74
July, 1922	55.6	42	65	54	74	74
Aug., 1922	54.5	39	65	53	81	72
Sept., 1922	55.6	40	65	55	87	72
Oct., 1922	57.1	43	65	57	87	72
Nov., 1922	58.4	45	67	60	86	71

Living Cost Slightly Less Than Year Ago

According to the National Industrial Conference board, New York, the cost of living among wage earners' families in the United States on Nov. 15, was 58.4 per cent higher than in July, 1914, as compared with 61.4 per cent in January, 1922. Between Oct. 15 and Nov. 15 there was an increase of 1.3 points, due to increases in food, clothing, coal and rents.

There was a decrease noted in light rates sufficiently large to cause a reduction in fuel and light combined, though coal prices increased 2.9 per cent in the month. Between July, 1920, when the peak of the rise in the cost of living since 1914 was reached, and November, 1922 the cost of living dropped 46.1 points, or 22.5 per cent. Further comparisons are given in the accompanying table.

Signs Amalgamated Scale

Pittsburgh, Jan. 16.—The TylerTube & Pipe Co., Washington, Pa., employing 1500 men, on Jan. 6 signed the scale agreement of the Amalgamated Association of Iron, Steel and Tin Workers. The scale became effective yesterday when operations were resumed. The former scale expired in June, 1921, and after that time an effort was made to operate the plant as an open shop. A joint statement issued today, signed by officials of the company and officers of the union, declared that no friction at any time had been in evidence.

Averages All Industrial Wage Advance

A substantial increase in hourly and weekly earnings in all classes of labor from July, 1922, to October, 1922, is shown by the results of an investigation made by the National Industrial Conference board, embracing 400,000 wage earners in 23 industries. The average hourly earnings of all wage earners were $0.238 in July, 1914. In July, 1922, they had risen to $0.484, in August to $0.486, in September to $0.495. In September, 1922, therefore, the average hourly earnings of all the wage earners covered were 108 per cent higher than in July, 1914.

The average weekly earnings of all wage earners, which were $12.27 in July, 1914, had risen to $23.09 in July, 1922, to $23.31 in August and to $23.88 in September. In the latter month they were 95 per cent above the July, 1914, level. The average weekly earnings of unskilled labor appear to have increased more since 1914 and during July, August and September of 1922 than those of skilled labor. Average weekly earnings of unskilled labor in July, 1922 were 87 per cent above 1914 and in September, 1922, 95 per cent above prewar levels, while those of skilled labor in July, 1922, were 86 per cent above 1914 and in September, 1922, had risen to 92 per cent above the July, 1914, level.

Puddlers Wages Raised

Wages for puddlers in the mills represented by the Western Bar Iron association in January and February will be $11.38 per ton, an advance of $1.26 over the rate in November and December, 1922. At the peak in January and February, 1921, the rate was $18.70 per ton, while the general average for 1914 was $5.60. Finishers and rolling mill hands will receive an increase of about 8 per cent for January and February.

The average sale price of bar iron in November and December, 1922, on which the wage rates are based, was 2.20c per pound, as determined by representatives of the associated mills and the Amalgamated Association of Iron, Steel and Tin Workers. The average selling price for 1922 was 1.76c. Further comparisons of selling prices follow:

	1922	1921	1920	1919	1918
Jan.-Feb.	1.60c	2.80c	2.55c	3.10c	3.10c
Mar.-Apr.	1.50c	2.55c	2.70c	2.75c	3.30c
May-June	1.60c	2.30c	3.00c	2.50c	3.35c
July-Aug.	1.70c	1.85c	3.25c	2.50c	3.40c
Sept.-Oct.	1.95c	1.70c	3.40c	2.50c	3.45c
Nov.-Dec.	2.20c	1.65c	3.55c	2.50c	3.45c
Yearly av'ge	1.76c	2.14c	3.08c	2.64c	3.34c

Beehive Coke Output in 1922, 8,030,000 Tons

Washington, Jan. 16.—Production of beehive coke in the calendar year 1922 is estimated by the geological survey at 8,030,000 net tons. In 1921 it was 5,538,000 tons; 1920, 20,511,000; 1919, 19,043,000, and in 1918, 30,481,000 tons. Production in 1922 was 73 per cent behind 1918, 58 per cent behind 1919, 61 per cent behind 1920, and 45 per cent ahead of 1921. Production by districts in 1922 compared with 1921 was as follows:

	1922	1921
Pennsylvania and Ohio....	6,137,000	4,528,000
West Virginia	549,000	209,000
Alabama, Tennessee, and Georgia	468,000	168,000
Virginia and Kentucky.....	445,000	381,000
Colorado and New Mexico..	229,000	99,000
Washington and Utah.....	202,000	153,000
United States total.....	8,030,000	5,538,000
Daily average	26,000	18,000

British Pig Iron Exports to United States Drop

London, Dec. 8.—According to the board of trade returns, 79,070 gross tons of British pig iron and ferromanganese were exported to the United States in November, the proportions being approximately 69,000 tons of pig iron and 10,000 tons of ferromanganese.

These figures would indicate that the apex of the movement has passed, the total being 13,083 tons less than the shipments in October when the combined exports of pig iron and ferromanganese were 92,153 tons. The November shipments, however, were higher than any month this year except October, being considerably in excess of the September exports which were 52,648 tons and the August shipments which were 22,987 tons.

The total exports of British pig iron and ferromanganese to the United States to Dec. 1 this year, according to the board of trade returns were 318,619 gross tons, of which about 132,000 tons were ferromanganese and 186,000 tons pig iron, mainly foundry grades.

Next to the United States, Canada was the largest buyer of British pig iron and ferromanganese in November, taking 13,426 tons compared with 6763 tons in October. Belgium in November took 7627 tons of pig iron and France 4140 tons.

Canada in November took 4458 tons of British tin plate compared with 1633 tons in October. United States took 60 tons compared with 48 tons in October.

British coal exports continue at a heavy rate, the total shipments in November being 6,570,758 tons compared with 6,196,411 tons in October, 3,593,864 tons in November, 1921, and 1,360,724 tons in November, 1920.

Buys Fabricating Plant

The plant of the Perkins Structural Steel Co., Flint, Mich., has been sold to the Massillon Bridge & Structural Co., Massillon, O. According to Elton Rice, president and general manager of the Massillon company, the local plant will be operated in conjunction with the present plant. He declared there will be no changes made and that production will continue. The main plant of the Perkins company at Wooster, O., was not included in the purchase.

Carnegie Men Dine

Pittsburgh, Jan. 16.—Operating officials of the Carnegie Steel Co. held their twenty-sixth annual banquet last Saturday night in the William Penn hotel with 100 present, representing practically all activities of the company. John H. Reed was toastmaster, and speakers were Walter H. Clingerman, who spoke on "Coal and River Transportation;" William Whigham, on "Steel and River Transportation," and Homer D. Williams on "Pittsburgh and River Transportation."

The program carried an embossed engraving of the Carnegie Steel Co. safety trophy, the work of G. Moretti, Pittsburgh sculptor. It was announced that this trophy will be given to the Edgar Thomson Steel Works for maintaining the best accident record.

To Barge More Steel

Birmingham, Ala., Jan. 16.—Alabama Dry Dock and Shipbuilding Co., Mobile, will build at once nine barges for use on the Warrior river service for the Tennessee Coal, Iron & Railroad Co. The steel for these craft is to be manufactured at the Ensley plant of the Tennessee company and will be fabricated by the Johnson & Thompson plant at North Birmingham. The barges will add greatly to the facilities of the Tennesse company for shipping steel down the Warrior for export by way of the port of Mobile. They are to be completed within six to eight months.

Plans Many Locomotives

Directors of the Pennsylvania railroad have authorized the placing of 300 locomotives for 1923. Of this total, 125 will be constructed at the company's Altoona shops and 100 by the Baldwin Locomotive Works. The allotment of the remaining 75 will be determined later.

Armor Plate Needed for Modernizing Navy

Washington, Jan. 16.—Some 30,000 tons of armor plate may be required by the navy department if congress grants the $6,500,000 requested by President Harding for the modernization of capital ships. The plan of the navy department is to undertake work first on 13 ships, equipping them with deck protection from high-angle fire and aircraft bombs and adding "blister" protection against torpedoes. A clause of the agreement on naval limitation permits up to 3000 tons additional displacement for each capital ship for this reconstruction. Some replacement of small-caliber guns and reconstruction of turrets to permit high angles of fire also will be attempted, but the materials probably will come from the naval gun factory at the Washington navy yard.

British Columbia Steel Project Postponed

Vancouver, B. C., Jan. 13.—The British Columbia steel works project has been temporarily abandoned. Negotiations are still going forward, but the provincial government has decided to do nothing further with proposed legislation to aid the enterprise financially.

The plan of the Coast Range Steel Co. which was to have the joint support of the imperial, dominion and provincial governments, appears now to be some distance from fulfillment. Those who believe that the time is opportune for the establishment of a steel industry in British Columbia have gained encouragement from a special report submitted to William Sloan, minister of mines, by C. P. Williams, a British mining engineer, who recently investigated the iron-bearing deposits of the Pacific coast. Mr. Williams tells the government that it should be possible to produce steel on the Pacific coast cheaper than anywhere else in the world, with the possible exception of Germany or Belgium. He points to a rapidly growing market along the Pacific seaboard for steel products and to the demand of the Orient. He believes that eventually there should be not one, but several large steel mills in the province.

Resumption of work of the Esquimalt drydock at Victoria, B. C., has been ordered by J. H. King, federal minister of public works. The work is expected to be completed about June, 1924, and will cost $1,500,000. Tenders for $500,000 worth of operating plant and equipment will be called for soon.

Machinery Purchases Limited

Users Are Buying Only for Immediate Needs but Numerous Inquiries Indicate Future Demand of Size—Large Railroad Buying Is Still in Prospect—Crane Orders Are Small but Outlook Is Encouraging

EQUIPMENT buyers still are confining their purchases to actual needs, very little ordering for the future being noted. However, a more active market in machine tools and shop equipment is forecasted for the next few weeks as the result of the large number of inquiries which are becoming current. Practically every manufacturing center reports numerous inquiries but few actual sales.

An outstanding order of the week involved 10 to 12 tools and this was placed by the Otis Elevator Co. The General Electric Co. also was a buyer, while the National Tube Co. has started to buy against the list which it recently issued. The Nash Motors Co. and the Ford Motor Co. continue to purchase machinery. The automotive industry, in fact, is doing the bulk of the equipment buying at this time. The railroads are not actively in the market now, but the outlook for exceptionally large business from these interests is promising. Allied industries also are expected to buy.

Inquiries, principally for single machines, continue to flood the market. This is taken as a reflection of increased manufacturing operations, indicating a need for equipment for replacement purposes. The Bangor & Aroostook railroad has issued a list and other roads in New England are also expected to enter the market. The Rock Island is inquiring for several small tools but the Chicago, Burlington & Quincy has not yet issued its expected list. That large equipment purchases are planned by other roads is shown by the many appropriations which have been set aside for betterments to shop facilities. These appropriations are in addition to those made for rolling stock, etc.

Several more cranes have been purchased by the American Rolling Mill Co., Middletown, O., which was noted a week ago as buying 13. Orders for this class of equipment, however, are limited.

Equipment Inquiries Fair but Orders Are Small

NEW YORK, Jan. 16.—An order for 10 or 12 machine tools by the Otis Elevator Co. this city, features the local market, although an interesting contract involving largely special equipment has been placed with Joseph T. Ryerson & Son by the Hudson Shipbuilding & Dry Dock Co., Newburgh, N. Y. The order called for a complete flue shop equipment, and a 60-inch and 24-inch lathe.

Trading generally, however, is light notwithstanding a fair amount of inquiry. Railroad buying is virtually nil with little in prospect for the immediate future, although the New York, New Haven & Hartford is said to be working on the compilation of a list. The General Electric Co., Schenectady, N. Y., has closed on three forging hammers. Included in recent advances is an increase of 10 per cent by the Garvin Machine Co., New York, affecting some lines.

Crane inquiry continues quiet, with a few scattered orders being placed. Bids on a 15-ton locomotive crane, equipped with 50-foot boom, for the department of public works, Philadephia, awarded as reported last week to the Link-Belt Co., are as follows: The McMyler-Interstate Co., $12,470; M. & J. B. McHugh, understood to be representing the Brown Hoisting Machinery Co., $11,990; Browning Co., $11,720; Industrial Works, $11,700; Ohio Locomotive Crane Co. $11,475; Acme Machine Co., representing Link-Belt Co. $11,145; and Orton & Steinbrenner, $9895.

Single Tool Demand Still Rules

CLEVELAND, Jan. 16.—Activity in the local machine tool and shop equipment market is confined principally to orders for single machines. However, such orders are fairly numerous and on the whole the market is considerably more active than was the case the latter two weeks of 1922 and the first two weeks of the new year. Dealers on every hand express optimism and look for a steady increase in orders from this time on. Inquiries are exceptionally numerous and while the majority of them are for single machines, several call for more than this amount.

While the railroads have not been large buyers of equipment in this district dealers and manufacturers hold out the hope considerable purchases still will be made here before the railroad needs are fully satisfied. According to a local railroad official, the New York Central will expend $29,000,000 within the next few months on additions and betterments to its system. This is in addition to $54,000,000 invested in rolling stock. The Pennsylvania will expend approximately $55,000,000 on equipment and betterments and the Illinois Central will invest approximately $42,000,000. In addition to these the Louisville & Nashville and the Union Pacific will spend $27,000,000 and $20,000,000 respectively on improvements. It is obvious from these appropirations the railroads still have much to buy and a considerable part of their purchases will be of machine tools and shop equipment.

Inquiry Volume Is Larger

CINCINNATI, Jan. 16.—The outstanding feature of the local machine tool industry is the increased volume of inquiries. While no large business has been recorded, there is a good run of small orders. Sales of secondhand machinery have been quite numerous. Prospects for February are bright in view of the inquiries now coming out especially from automobile makers and the parts industry. The American Tool Works is negotiating for a large export order. The Williamson Heating Co., whose plant recently was damaged by fire is about to issue a list containing a dozen items. The

J. A. Fay & Egan Co. has booked several orders for woodworking machinery from Central Ohio users. Electrical specialty manufacturers are unusually busy and several of them are in the market for tools. The Louisville & Nashville railroad is expected to issue an inquiry shortly for machine tools. Paint machinery manufacturers report a good business. The J. H. Day & Co. and the Crawley Paint Machinery Co. have sold quite a number of paint grinders since Jan. 1. Paper mill machine shops and shoe and leather machinery makers are showing more interest. The Tennessee Copper & Chemical Co., of New York, is making rapid progress in the construction of its $500,000 plant here and will be in the market for some equipment soon.

Machinery Inquiry Is Improved; Sales Small

BOSTON, Jan. 16.—Inquiry for machine tools and shop equipment is considerably improved in this district. However, buying is not heavy. During the past few days the Bangor & Aroostook railroad entered the market for a fairly sizable amount of equipment and dealers and manufacturers are expecting the issuance of lists shortly by other roads here. Several paper mill operators purchased a number of lathes during the week, while a Rhode Island manufacturer placed orders for six tools, the total investment being in excess of $10,000. The Ford Motor interests continue to purchase machinery in this district. It is estimated that total machine tool sales during the week in Connecticut are in excess of $30,000.

Equipment Inquiries Are Numerous

CHICAGO, Jan. 16.—Increased inquiry for machine tools is evident and quotations are being asked freely by users in need of additional equipment. Negotiations are being undertaken for sales and trades and the market generally is more active than for some time. However, sales are not numerous and consist mostly of single tools, to a widely diversified list of buyers.

Railroads are indifferent, the expected list by the Burlington & Quincy not having yet appeared. The Rock Island railroad is inquiring for a portable lathe and the Santa Fe is asking figures on a single tool. Nash Motors Co. continues to buy a few small tools. Other large users are not taking additional equipment. Planers are being advanced 5 to 15 per cent, according to size, announcement of the increase recently having been sent out by some makers.

Orders and Inquiries Are Improved

PITTSBURGH, Jan. 16.—Improvement is noted in the equipment market and as was anticipated many industrial companies which a few weeks ago were deferring purchases are either ordering or issuing inquiries. So far sales of machine tools have not been particularly numerous, although attractive orders for heavier equipment such as cranes are noted from week to week. The American Rolling Mill Co., Middletown, O., has placed several additional cranes with the Morgan Engineering Co., Alliance, O., following up the order for 13 reported one week ago. The Universal Steel Co., Bridgeville, Pa., bought four 10-ton cranes instead of one as reported last week. Several other orders for one or two cranes each likewise are noted. Buying of machine tools on its large list for Gary, Ind., tube mill has commenced by the National Tube Co. One seller here reports disposing of a 30-inch lathe and a 36-inch planer. Another has an order for a 30-inch lathe, a milling machine and a boring mill. Additional orders will be forthcoming shortly. The Pennsylvania railroad has been distributing orders on its list including two rod-boring machines and a milling machine to a dealer here. A local user has bought a 16-inch shaper, an 18-inch lathe and a 20-inch drill press. This same seller disposed of two other 16-inch shapers to two separate

Crane Awards and Inquiries of the Week

Orders Placed

One 250-ton crane, 71-foot span and one 15-ton locomotive crane for the Kansas City Southern railroad, Kansas City, Mo., to the Whiting Corp., Harvey, Ill.

One 5-ton crane, 22-foot span, for Fairbanks, Morse & Co., Beloit, Wis., to the Whiting Corp.

One 200-ton locomotive jackhoist for the Missouri Pacific railroad, to the Whiting Corp.

One 30-ton electric traveling crane with 32-foot 9 inches span, for the Adirondack Light & Power Co., Amsterdam, N. Y., to the Northern Engineering Works, Detroit.

One 40-ton, 2-motor electric traveling crane trolley, for the New York, New Haven & Hartford railroad, to the Northern Engineering Works.

One 5-ton, 3-motor type electric traveling crane with 35-foot span and one 10-ton crane of the same span and type, for the General Electric Co., Erie, Pa., to the Northern Engineering Works.

Four 10-ton cranes instead of one as reported last week for the Universal Steel Co., Bridgeville, Pa., to the Pawling & Harnischfeger Co., Milwaukee.

One 25-ton crane for the open-hearth furnace of the Allegheny Steel Co., Brackenridge, Pa.

One 7½-ton 3-motor crane with 58-foot, 4-inch span for the Blackwood Electric Steel Co., Parkersburg, W. Va., to the Milwaukee Electric Crane & Mfg. Co., Milwaukee.

One 5-ton, 3-motor crane with 39-foot 6-inch span complete with magnet, winding drum and controls for the National Radiator Co., Johnson Pa., to the Milwaukee Electric Crane & Mfg. Co., Milwaukee.

Two 3-ton, 3-motor cranes with 26-foot 9-inch span for the National Radiator Co., New Castle, Pa., to the Milwaukee Electric Crane & Mfg. Co., Milwaukee.

One 10-ton used crane for the Moss Iron Works, Cleveland, to a Cleveland dealer.

One 250-ton, 7-motor crane, 71-foot span, and one 15-ton, 3-motor crane, 42-foot span, placed by a New York engineer, for Kansas City Southern railroad, with Whiting Corp.

One 20-ton handpower overhead crane, equipped with motor hoist, placed through Henry L. Dougherty, New York, for City Light & Traction Co., Sedalia, Mo., with Whiting Corp.

Two 160-ton and one 150-ton wrecker for the Canadian National railways, to Industrial Works.

Two 40-ton locomotive cranes, 50-foot boom, for Pickands, Mather & Co., Cleveland, for operation in Minnesota, to Industrial Works.

Several jib and piller cranes for the Pullman Co., Chicago, to Whiting Corp.

One 30-ton, 4-motor crane, span 53 feet, equipped with 5-ton auxiliary, for installation in a foundry of the General Electric Co., Schenectady, N. Y., to Champion Engineering Works.

One special 10-ton crane for Chain Belt Co., Milwaukee, for export to the Milwaukee Electric Crane & Mfg. Co.

Three 5-ton, 2-motor cranes, 17-foot span, for E. W. Bliss & Co., Brooklyn, to Shaw Electric Crane Co.

Two 3-ton and one 5-ton electric cranes for the National Radiator Co., Johnstown, Pa., to Milwaukee Electric Crane & Mfg. Co.

Orders Pending

Crane inquiry for six or more cranes expected shortly from C. L. Pollock for new 8-mill sheet mill to be erected in the Cleveland district.

Two or three cranes for Conway, Pa., shop of the Pennsylvania railroad; bids being considered.

31 cranes, large steel interest in the Pittsburgh district; inquiry issued late last week.

One 10-ton crane for the Greenville Steel Car Co., Greenville, Pa., bids all in; early action expected.

Small crane with special features for the Gifford-Woods Co., Oakmont, Pa.; bids being taken.

One 10-ton crane with 60-foot span for the Crucible Steel Co. of America, Pittsburgh; bids being taken; appropriation deferred.

One 10 or 15-ton crane trolley, American Sheet & Tin Plate Co., Pittsburgh; bids being taken.

One 15-ton gantry crane with two hoists, Carnegie Steel Co., for Central dock; action still deferred.

Several cranes, Jones & Laughlin Steel Co., Pittsburgh district; bids being taken.

Cranes for different United States Steel Corp. units in Pittsburgh and Youngstown, O., districts; bids being taken.

One 10-ton crane, Spang, Chalfant & Co., Pittsburgh; Michigan builder's crane favorably considered.

One 3-ton or 5-ton, Gary Screw & Bolt Co., Gary, Ind.; action still deferred.

Two pneumatic cranes, 10, 15 or 20-ton, with tanks, Clairton by-product coke plant, Carnegie Steel Co.

One 10-ton crane for Weirton by-product coke plant; bids being considered by the Koppers Co., Pittsburgh.

Three 125-pound ladle cranes for Carnegie Steel Co., Duquesne, Pa.; dealers believe purchase will be postponed.

One each 5-ton and 7½-ton, Pittsburgh district manufacturer; bids being taken.

Two cranes, Pittsburgh district steelmaker; inquiry issued by telephone on Saturday last to be closed this week.

One 10-ton electric crane, 74-foot span, for Selbach-Meyer Co., West New York, N. J., to be placed shortly.

One 60-ton, 4-motor crane, with either 45 or 50-ton span, and one 20-ton, 1-motor crane, 18-foot span for Phoenix Utilities Co., New York, bids asked.

One ash-handling crane equipped to lift a 5-yard bucket at an 80-foot radius, for the Brooklyn Edison Co., Brooklyn.

An overhead crane for the Anaconda Copper Co., 25 Broadway, New York, pending.

buyers, a 20-inch shaper, a 2500-pound steam drop hammer, a 19-inch lathe, an electric tool grinder and a horizontal boring mill with 3-inch bore, mostly to buyers in the Pittsburgh district. Prompt deliveries are wanted inditcating that the machinery is being put to immediate use since most of the machines referred to were delivered from the display floor.

The used machinery market too is active, the Reliance Machinery Sales Co. reporting numerous successfuly negotiations, one covering 12 or more items including two double action cam drawing presses; two each horning presses and inclinable presses; one straight side press, an arbor press, two grinders and a milling machine as well as some tumbling barrels. This seller likewise disposed of a 26-inch open side planer locally, an oil separator to a Vermont user, a 28-inch lathe with 12-foot bed, a turret lathe for shipment to New Castle, Pa., as well as a pipe machine locally and a press to a Detroit, Mich., manufacturer. Several inquiries are current for from one to six or eight used machines each in good condition.

Prices continue to advance. One local dealer reports that on a line of shears on which a 10 per cent discount from the list has been granted for some time the discount has been withdrawn effective Jan. 15.

Slight Improvement in Demand

TORONTO, Ont., Jan. 16.—Business in machine tools remains steady. Slight improvement is reported by some dealers and builders. Prospective business is encouraging and the majority of inquiries being received are of a nature that will turn into actual sales soon. Considerable factory construction work is reported. The Canadian National railways is placing contracts for cars, engines and general rolling stock, and it is reported a fairly large tonnage of steel rails was placed during the week. The placing of equipment contracts by Canadian railways is expected to be reflected in a stronger demand for equipment from plants sharing in this business. Automotive industries are becoming active and plants are being put in order for greatly increased outputs. The demand for woodworking equipment and for machinery for pulp and paper plants is increasing. Mining companies are spending large sums on new plant account and some large shipments of equipment will be made to Northern Ontario shortly. Small tools are in active demand and prices are tending upward.

Demand for electrical machinery and supplies is active and the uncertainty as to the fuel supply during the coming summer is further stimulating demand. In addition to the local demand for electrical equipment, Canadian manufacturers are being given opportunities to tender on a large amount of business on export account. The department of trade and commerce, Ottawa, Canada, has received word that the state electricity commission of Victoria, 22-32 William street, Melbourne, Australia, is asking for bids on the supply and delivery of considerable electrical equipment.

The time for receiving bids for machinery and equipment for Esquimalt, B. C. drydock has been extended. Bids will now be received by R. C. Desrochers, secretary, department of public works, Ottawa, Canada, until Feb. 15. The North York township, Ont., council will spend $125,000 on a waterworks plant. The town council of Sandwich, Ont., is having plans prepared for a sewage disposal plant. The town council, Fort Erie, Ont., will spend $10,000 on an addition to its electric light plant. The Canada Wire Fence Co., Whitby, Ont., Col. J. A. Currie, Warren road, Toronto, Ont., will build a plant at Whitby. The Howard Furnace Co. Yonge street, Toronto, Ont., has started work on a 4-story assembling plant.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

HOLT, ALA.—The Central Foundry Co. is reported planning some improvements to its plant.

DANBURY, CONN.—The Danbury Unbreakable Tool Corp. has been incorporated with $50,000 capital by John W. Stolle, Fred A. Stolle and A. Casassa.

DANBURY, CONN.—The New England Metal Barrel Corp. has been incorporated with $75,000 capital by Granville Whittlesey, E. M. Crowe and Harry E. Pulver.

NEWINGTON, CONN.—The American Machinery & Equipment Co. plans a 1-story, 100 x 225-foot factory.

WATERBURY, CONN.—Plans are being prepared by the Connecticut Castings Co. for a plant addition.

WEST HARTFORD, CONN.—The Hennett Metal Treading Co. has been incorporated with $50,000 capital stock by A. J. German and others of Waterbury, Conn.

JACKSONVILLE, FLA.—The Lester Car Pedestal Co. has been incorporated with $50,000 capital stock by Raymond Lester, S. H. W. Hornibrook and others.

CHICAGO—The Pressed Steel Mfg. Co., 20 West Jackson boulevard, plans a 2-story factory building.

CHICAGO—The United Autographic Register Co., 2316 West Forty-third street, has let a contract for a 2-story factory building, 61 x 96 feet, to cost about $40,000.

CHICAGO—The Bates Expanded Steel Truss Co., 208 South La Salle street, plans a 1-story factory building, 80 x 120 feet, to cost about $100,000.

CHICAGO—The Searles Electric Welding Works, Inc., 817 West Washington boulevard, has been incorporated with $50,000 capital stock by A. M. Searles, M. J. Searles and E. S. Peacock.

CHICAGO—The Gem Rubber Co., 1315 South Oakley avenue, has been incorporated with $5000 capital stock by Ida Pass, Hyman Pass and Jacob Bloomfield. The company is represented by Epstein & Leonard, 76 West Monroe street.

CHICAGO—The Triple-Kote Rustless Steel Co., 111 West Monroe street, has been incorporated with $1000 capital stock by C. Bransfield, Frank C. Wilkinson and A. E. Kelleher. The company is represented by S. K. Markham, 139 North Clark street.

CHICAGO—The Killion Steel Barrel Co., 10 South La Salle street, has been incorporated with $30,000 capital stock by John G. Riordan, J. H. Killion and others. The company is represented by John G. Riordan, 10 South La Salle street.

CHICAGO—The Advance Metals Corp., 4709 South Halsted street, has been incorporated with

$10,000 capital stock by Michael H. Haymer, Arthur McCracken and George S. McGuire. The company is represented by J. L. Bynum, 140 North Dearborn street.

CHICAGO—The Illinois Machinery Sales Corp., 551 West Washington boulevard, has been incorporated with $75,000 capital stock by E. P. Essley, J. R. McDonald and E. L. Essley. The company is represented by Durant & Brady, 97 Wisconsin street, Milwaukee.

CHICAGO.—The Frank B. Cook Co., 5485 Woodlawn avenue, has been incorporated with $10,000 capital stock to manufacture and deal in machinery, etc., by D. G. Ramsay, C. C. Newburn, H. Roy Cook and Frank B. Cook. The company is represented by Anthony J. Schmidt, 30 North La Salle street.

EAST ST. LOUIS, ILL.—The Cahokia Power Co., 7 Collinsville avenue, has been incorporated with $100,000 capital stock by Robert J. Kinsella Jr., Lee Enright, L. J. Higdon, A. R. Mueller and U. H. Deftry. The company is represented by Joudan, Rassieur & Pierce, St. Louis.

ROCKFORD, ILL.—The Marvel Gas Saver Co., 1902 Seventh street, has been incorporated with $5000 capital stock to manufacture gasoline devices, by A. F. Hogland, D. H. Crusic, Meade Dubrow and others. The company is represented by Albert D. Karly, attorney.

GOSHEN, IND.—The Thomas-Albright Co. has increased its capital stock from $24,000 to $100,000. It operates a foundry.

PLYMOUTH, IND.—A vocational department will be installed in a 2-story high school, 163 x 180, estimated to cost $300,000, for which bids are being asked. Ernest W. Young, 612 Dean building, South Bend, Ind., is architect.

SOUTH BEND, IND.—The Malleable Iron Range Mfg. Co. has increased its capital stock from $40,000 to $400,000.

ASHLAND, KY.—The Norton Iron Works has increased its capital stock from $311,500 to $1,860,000.

CAMPBELL, KY.—The Newport Body Mfg. Co. has been incorporated with $35,000 capital stock by A. M. Larkin, J. P. Weckman and W. C. Botts of Newport; Andrew Donaldson, Ft. Thomas; Matt Herold, Bellevue and Emer Kirker, Ft. Thomas.

JEFFERSON, KY.—The Star Wood Products Co. has increased its capital stock from $75,000 to $125,000.

LOUISVILLE, KY.—The Brandeis Machinery & Supply Co. has increased its capital stock from $15,000 to $25,000.

LOUISVILLE, KY.—The Mengel Body Corp. has started work on an automobile body plant here.

LOUISVILLE, KY.—The Louisville Car & Foundry Co. has increased its capital stock from $10,900 to $75,000.

LOUISVILLE, KY.—The Laib Co., pipe valves, has increased its capital stock from $150,000 to $900,000.

LOUISVILLE, KY.—The Ford Motor Co., Detroit, has placed a contract with the H. K. Ferguson Co., Cleveland, for an addition to its local assembling plant.

LOUISVILLE, KY.—The Sheet Metal Supplies Co. has been incorporated with $40,000 capital stock by L. H. Harpring, J. E. Sikking and George J. Ramser.

LOUISVILLE, KY.—The Drummond Mfg. Co. has placed contracts with the Louisville Bridge & Iron Co. for an addition to cost about $25,000.

LOUISVILLE, KY.—The Henry Vogt Co., die manufacturer, has been incorporated with $10,000 capital stock by Henry Vogt, G. A. Heuser and G. A. Dauble Jr.

PORTLAND, ME.—The Flexto Mfg. Co. has been incorporated with $10,000 capital stock to manufacture scrapers, etc., by Herman W. Willard and others.

BALTIMORE—The Reus Mfg. Co., piston rings, has been incorporated by B. J. Reus, J. F. Reus Jr., and S. Wilson Morrow.

BALTIMORE—The J. M. Adams Co., sheet metal, 733 Ensor street, has acquired a 2-story building which it will equip for the manufacture of metal products.

BALTIMORE—The National Pipe & Nipple Co., Inc., 62 Whitridge avenue, has been incorporated by J. S. Clark, A. A. Clark and others.

BOSTON—The American Saw Filing Machine Co., 36 Washington street, North, has been organized by Howard B. Hall, J. A. Hall and Frank H. Hall.

BOSTON—The American Architectural Iron Works has been incorporated with $450,000 capital by John W. King, Israel Sisson and James A. Spillane.

BOSTON—The Murray Iron Foundry, Inc., has been incorporated with $40,000 capital by Elbridge G. Gigger, James Murray, Gardner, Mass., and George M. Faulkner.

BOSTON—The Toledo Metal Furniture Co. of New England has been incorporated with $50,000 capital by Homer Morrison, Newton, Mass., Danforth W. Comins, Winchester, Mass., and M. B. Palmer, Somerville, Mass.

CAMBRIDGE, MASS.—The Elliot Addressing Machine Co., Albany street, has let a contract for a 4-story addition, 45 x 70 feet.

NORTHAMPTON, MASS.—The C. A. Maynard Co. has been incorporated with a capital stock of $50,000 to operate a foundry and machine shop by Champion B. Swift, Maynard Swift, A. M. Swift and M. H. Swift.

SPRINGFIELD, MASS.—The Kent-McKey Co. has been incorporated to deal in tools, hardware and machinery with $5000 preferred stock and 200 shares of common stock without par value by William H. Kent, Harvard, Mass., Richard H. McKey and Joseph J. Hassett.

DETROIT—The General Smelting & Refining Co. has been incorporated with $10,000 capital stock by Samuel Cooper, 678 Leland avenue, Daniel Temchin and Cipo Cooper.

DETROIT—The Ray Motor Co. has been incorporated with $100,000 capital stock by Ray Reilly, 248 Edmund place, John H. Nolan and Leonard H. Carley, Watertown, Conn.

CHEBOYGAN, MICH.—The Cheboygan Brass Foundry plans to rebuild the part of its plant which recently was damaged by fire.

CONCORD, N. H.—Contract has been awarded by the Boston & Maine railroad for a locomotive repair shop at Meriden, Conn.

GLOUCESTER CITY, N. J.—Plans have been authorized by the city council for erecting an electrically operated pumping plant. The cost will be approximately $250,000.

KEARNY, N. J.—Work will be started shortly by the Western Electric Co. on a large plant which will be devoted principally to the manufacture of telephone cable. A 55-acre site has been purchased in the Kearny Meadows.

NEWARK, N. J.—The Treat Place Body Works plans to establish a plant here for the manufacture of automobile bodies.

BROOKLYN, N. Y.—The Mansfield Iron Works has been incorporated with $10,000 capital stock by L. and P. Savino, and E. Brown. The company is represented by A. Madeo, 215 Montague street, Brooklyn.

BROOKLYN, N. Y.—The Carpenter Con-

Business Changes Recently Announced

EXECUTIVE and sales offices of Newton Steel Co. will be moved to the ninth floor of the Stambaugh building, Youngstown, O., as soon as the Brier Hill Steel Co.'s offices, now occupying that floor, are vacated. The Brier Hill company is completing a 4-story office building at its plant and all offices not abolished when Youngstown Sheet & Tube Co. takes possession, will move to the new building. Newton Steel Co.'s operating offices are now housed in an office building at the plant in Newton Falls.

* * *

Advices have been received from the National Screw and Tack Co., Cleveland, to the effect it now is operating under the corporate name, the National Screw & Mfg. Co.

* * *

The Uehling Instrument Co., Paterson, N. J., has appointed the Mine & Smelter Supply Co., El Paso, Tex., its exclusive representative for the sale of recording and other power plant equipment, in the states of Arizona and New Mexico, as well as in western Texas and Mexico.

* * *

Opening of an office in St. Louis in charge of Thomas E. Beasley, has been announced by the Ohio Electric & Controller Co., Cleveland.

* * *

The Southern Industrial Engineering Co., Inc., American Trust building, Birmingham, Ala., has been appointed representative for the Ohio Electric & Controller Co., Cleveland.

* * *

The Combustion Engineering Corp. has acquired the Quinn Oil Burner & Torch Co., and is now able to furnish complete oil burning equipment, including pump sets, tanks, etc. The company also is prepared to furnish engineering service with relation to the installation of such equipment. W. R. Quinn, former president of the Quinn Oil Burner & Torch Co., has been appointed manager of fuel oil department of company.

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.065c
Buffalo	3.10c
Chicago	2.80c
Cincinnati	2.95c to 3.10c
Cleveland	2.91c
Detroit	3.00c
New York	3.04c
Philadelphia	3.00c
San Francisco	3.40c
Seattle	3.60c
St. Louis	2.90c
St. Paul	3.05c
Los Angeles	3.50c

IRON BARS

Boston	3.065c
Buffalo	3.10c
Chicago	2.80c
Cincinnati	3.10c
Detroit	3.00c
New York	3.04c
Philadelphia	3.00c
St. Louis	2.90c

SHAPES, STRUCTURAL

Boston	3.165c
Buffalo	3.20c
Chicago	2.90c
Cincinnati	3.05c to 3.20c
Cleveland	3.01c
Detroit	3.10c
New York	3.14c
Philadelphia	3.10c
San Francisco	3.40c
Seattle	3.60c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.60c

PLATES

Boston	3.165c
Boston 3/16-inch	3.04c
Buffalo	3.20c
Chicago	2.90c
Cincinnati	2.95c to 3.20c
Cleveland	3.01c
Detroit	3.10c
Detroit, ¼-inch	3.30c
New York	3.14c
Philadelphia	3.10c
Philadelphia, ¼-inch	3.30c
an Francisco	3.50c
Seattle	3.60c
St. Louis	3.00c
St. Paul	3.15c
Los Angeles	3.75c

NO. 10 BLUE ANNEALED SHEETS

Boston, ¼-inch	4.15c
Buffalo	4.05c
Chicago	4.00c
Cincinnati	3.75c to 4.00c
Cleveland	3.50c to 3.76c
Detroit	3.95c
New York	4.19c
Philadelphia	3.85c
San Francisco	4.50c
Seattle	4.85c
St. Louis	4.10c
St. Paul	4.25c
Los Angeles	4.70c

NO. 28 BLACK SHEETS

Boston	5.40c
Buffalo	4.85c
Chicago	4.85c
Cincinnati	4.00c
Cleveland	4.25c
Detroit	4.40c
New York	4.80c to 4.90c
Philadelphia	4.60c
San Francisco	6.05c
Seattle	5.85c
St. Louis	4.95c
St. Paul	5.10c
Los Angeles	6.10c

NO. 28 GALVANIZED SHEETS

Boston	6.40c
Buffalo	5.85c
Chicago	5.85c
Cincinnati	5.20c
Cleveland	5.25c
Detroit	5.40c
New York	5.80c to 5.90c
Philadelphia	5.75c
San Francisco	6.90c
Seattle	6.85c
St. Louis	5.95c
Los Angeles	6.90c

BANDS

Boston	4.25c
Buffalo	3.90c
Chicago	3.55c
Cincinnati	3.70c to 3.85c
Cleveland	3.71c
Detroit	3.80c
New York	3.84c
Philadelphia	3.80c
San Francisco	4.05c
Seattle	4.35c
Los Angeles	4.40c

HOOPS

Boston	4.75c
Buffalo	4.10c
Cleveland	3.71c
Detroit	4.20c
New York	4.39c
Philadelphia	4.25c
Seattle	5.00c

COLD ROLLED STEEL

Boston (rounds)	4.00c
Boston (shapes)	4.50c
Buffalo (rounds)	3.95c
Buffalo (shapes)	4.45c
Chicago (rounds)	3.80c
Chicago (shapes)	4.30c
Cincinnati (rounds)	3.75c
Cincinnati (shapes)	4.25c
Cleveland (rounds)	3.75c
Cleveland (shapes)	4.25c
Detroit (rounds)	3.80c
Detroit (shapes)	4.30c
New York	3.90c
New York (shapes)	4.40c
Phil delphia (rounds)	3.85c
Philadelphia (shapes)	4.35c
San Francisco (rounds)	5.00c
Seattle (rounds)	5.25c
Los Angeles (rounds)	5.10c

tainer Co. has been incorporated with $10,000 capital stock by A. F. and W. O. and H. L. Carpenter. The company is represented by W. W. Welsh, 29 Byerson street.

BUFFALO—The Pratt & Letchworth Co., 189 Tonawanda street, plans a foundry addition.

BUFFALO—The Flexlume Sign Co., 74 Kall street, plans a factory building at an estimated cost of $45,000.

BUFFALO—The All Efficient Carburetor Co. has been incorporated with $50,000 capital stock by G. Gavey, E. E. Hone and A. C. Staller. The company is represented by S. E. Tanner, attorney.

BUFFALO—The Morrison Risman Rail Corp. has been incorporated with $1,000,000 capital stock by M. F. Dirnberger Jr., J. O. Moore and H. L. Jauch. The company is represented by Dirnberger & Moore, attorneys.

CARTHAGE, N. Y.—The Carthage Machine Co. has increased its capital stock from $25,000 to $100,000.

LANCASTER, N. Y.—The Lancaster Machine & Knife Works has increased its capital stock from $100,000 to $200,000.

NEW YORK—The Ideal Radiator Cap Co. has increased its capital stock from $75,000 to $225,000.

NEW YORK—Work will be started shortly on a 1-story plant, 50 x 100 feet, by the Escher & Obaler Iron Works, 941 Cortland avenue.

NEW YORK—The Air Reduction Co. with headquarters in this city, will start work shortly on a $150,000 plant in Baltimore.

NEW YORK—The Escher & Obaler Iron Works, 941 Cortlandt avenue, plans a 1-story plant building, 50 x 100 feet.

NEW YORK—The W. D. Plumb Corp., metal furring, has been incorporated with $5000 capital stock by W. D. and E. Plumb and E. Tracey. The company is represented by H. C. Knoeppel, 5 Beekman street.

NEW YORK—The Consumers Foundry Co. has been incorporated with $250,000 capital stock by S. G. Benson, J. M. Schwartz and E. S. Washburn. The company is represented by J. T. Crane, 2 Rector street.

NEW YORK—The Lorraine Metal Mfg. Co. has been incorporated with $30,000 capital stock by G. Feinman, G. Heisner and P. Rounen. The company is represented by Phillips & Jaffe, attorneys, 1170 Broadway.

NEW YORK—Parkhurt Forge, wrought iron works, has been incorporated with $25,000 capital stock by C. O. Baese, M. A. Lover and L. Woeger. The company is represented by G. L. Stamm, 140 Nassau street.

SYRACUSE, N. Y.—The Continental Can Co. plans extensions and improvements to its plant.

UTICA, N. Y.—The Utica Heater Co. has increased its capital stock from $550,000 to $850,000.

WEST NEW BRIGHTON, N. Y.—The Brighton Dry Dock Co. has been incorporated with $250,000 capital stock by J. O. Connor, M. E. Saunders and A. W. Osborn. The company is represented by F. E. Stripe, 220 Broadway.

AKRON, O.—The Seamless Ribbed Tube Co. has been incorporated with $500,000 capital stock by John A. Elden, George H. Field, William Bradfield and others.

CINCINNATI—The Old-Royd Machine Co. has been incorporated with $10,000 capital stock by Fred Oldroyd, Cyrus S. Oldroyd, and others.

CINCINNATI—The Automobile Gear & Parts Co. has been incorporated with $25,000 capital stock by A. H. Kellmer, M. C. Schmidt and others.

CLEVELAND—The Tad Buckle & Mfg. Co. has been incorporated with $50,000 capital stock by D. D. Hurlbut, Allison M. Gibbons, William G. Benedict, Edward H. Tracy and others.

CLEVELAND—The Zellner Foundry Co. has been incorporated with $60,000 capital stock by Karl J. Zellner, W. R. Brower, R. E. Sheal, M. E. Mullin and L. C. Steen.

COLUMBUS, O.—The plant of the Buckeye Steel Castings Co. recently was damaged by fire.

BUTLER, PA.—The Butler Armature Works has been incorporated with $50,000 capital stock by L. R. Phillips, G. W. Cook and B. R. Williams.

HAMBURG, PA.—The Hamburg Boiler Works has been incorporated with $60,000 capital stock by Henry Seiders, Harry A. Seiders and Catharine Seiders.

KINZUA, PA.—The Kinzua Power & Light Co. has been incorporated with $5000 capital stock by Fred H. Smith, C. C. Flatt and H. R. French.

LANCASTER, PA.—A 1-story, 90 x 140-foot plant addition will be erected by the Lancaster Steel Products Co.

PHILADELPHIA—The American Pulley Co., 4200 Wissahickon avenue, plans a 1-story addition to cost about $17,000.

PHILADELPHIA—The Pennsylvania Brick & Tile Co. has awarded a contract to the Cemprod Engineering & Construction Co. for a $12,000 factory building.

PHILADELPHIA—The Star Expansion Bolt

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco
Cincinnati

Co. has been incorporated with $3000 capital stock by Robert J. Regan, Jasper and Tioga streets; George O. Nichtelein, 123 North Fiftieth street, and Harold Fredrikson, 5110 Folsom street.

PHILADELPHIA—Property, comprising 19,000 square feet at the Northwest corner of Thirty-third and Arch streets has been purchased through Mastaum Bros. & Fleisher, by a manufacturing syndicate which will start work immediately on a large manufacturing loft building.

PITTSBURGH—The Hipwell Mfg. Co., 831-35 West North avenue, plans an addition to its plant.

PITTSBURGH—The Bushnell Machinery Co. has been incorporated with $25,000 capital stock by Carl D. Bushnell, 94 Pilgrim road, Rosslyn Farms, Pa.; Charles L. Inglefield, 141 Dunbar avenue, Bellevue, Pa., and Robert S. Campbell, 2136 Beechwood boulevard, this city.

READING, PA.—Bids will be received Jan. 18 by the Ballinger Co., Philadelphia, architects in charge, for a foundry and machine shop for the Reading Hardware Co.

WOONSOCKET, R. I.—The Woonsocket Machine & Press Co., 533 Second street, plans a 2-story addition, 50 x 100 feet, to cost about $25,000.

WOONSOCKET, R. I.—Brenner Bros., Inc., has been organized to deal in scrap iron, etc., by Jacob and Rebecca Brenner and James T. Greene.

CHATTANOOGA, TENN.—The Price-Evans Foundry Co. has increased its capital stock to $120,000.

CHATTANOOGA, TENN.—The Eureka Foundry Co. has increased its capital stock to $50,000.

CHATTANOOGA, TENN.—The Moccasin Bushing Co. has been incorporated with $50,000 capital stock by J. C. Sharp, J. S. Poindexter and W. F. Ward.

LIVINGSTON, TENN.—The Hardware Products Co. has been incorporated with $15,000 capital stock by J. G. Crouch, T. M. Oakley and J. M. Spurrier.

ST. ALBANS, VT.—The repair shop of the Central Vermont railroad recently was damaged by fire.

Value of Power Pump Output Declines

MANUFACTURERS of steam and other power pumps in 1921 produced a product valued at $47,239,000 which compares with $53,746,000 in 1919, the census bureau reports. Cost of material used totalled $18,676,000 in 1921 and $23,908,000 in 1919. Salaries and wages paid in 1921 amounted to $17,179,000 and approximately $18,799,000 in 1919. The number of persons engaged in the industry was 11,409 in 1921 and 13,286 in 1919, but the number of establishments 135 in 1921 was 23 greater than in 1919.

CHARLOTTESVILLE, VA.—The Walker Iron Works has been incorporated with $100,000 capital stock by Charles M. Walker, A. A. Walker and others.

NORFOLK, VA.—The Atlas Steel & Iron Corp. has been incorporated with $50,000 capital stock by Abraham Eichelbaum, Herman Golantry and others.

ROANOKE, VA.—The H. C. Baker Co., Inc., electrical devices, has been incorporated with $20,000 capital stock by H. C. Baker, J. P. Saul Jr., and others.

ST. ALBANS, W. VA.—The St. Albans Electric & Light Co., has been incorporated with $100,000 capital stock by J. E. Campbell, W. G. Matthews and G. F. Skidmore.

APPLETON, WIS.—Architects Perkins, Fellows & Hamilton, Chicago, have been selected to prepare plans for two junior high and vocational schools to be erected here. Carrie E. Morgan is secretary of the board of education.

MILWAUKEE—A 2-story factory addition, 40 x 85 feet, will be erected for the T. L. Smith Co., concrete mixers, by Klug & Smith, engineers, 32 Mack block.

MILWAUKEE—A charter has been granted to the Kwik-Mix Concrete Mixer Co., incorporated with 1000 shares of nonpar common stock by Carl B. Rix, John M. Barney and D. L. Brooke, 120 Wisconsin street, in behalf of a group which intends to manufacture machinery.

MILWAUKEE—Articles of incorporation have been filed by the Western Brass Mfg. Co., capital stock $40,000. The incorporators are local attorneys representing the owners of the Western Brass & Aluminum Foundry Co., 241-243 Reed street, which is a partnership, organized several years ago by I. H. Bierman and S. M. Liebenberg.

NICHOLS, WIS.—The Nichols Mfg. Co. has been incorporated with $25,000 capital to manufacture anti-glare shields and other automobile specialties. For the present the concern will use part of the plant being erected by the All-American Metallic Casket Co. here.

PORTAGE, WIS.—Williams Nehls, pioneer boat and canoe builder, has plans for a 2-story factory, 41 x 80 feet, which will be equipped both for boat building and the manufacture of a new type of heating furnace.

SHEBOYGAN FALLS, WIS.—Contracts have been let by the Falls Motors Corp., automobile, truck and tractor engines, for a 1-story addition, 50 x 75 feet.

SUPERIOR, WIS.—The capital stock of the Superior Iron Works has been increased from $70,000 to $120,000.

WEST ALLIS, WIS.—The Gas Tank Recharging Co., Milwaukee, which will build a new $75,000 plant here, has let the general contract to Otto Randolph & Co., 53 West Jackson boulevard.

New Trade Publications

SMALL TOOLS—Consolidated Tool Works, Inc., New York, is circulating a 28-page illustrated booklet in which small tools are described and illustrated. These include hacksaws, braces, planes, drills, calipers and dividers, wrenches, tool and tap holders, micrometers, etc.

INDUSTRIAL EQUIPMENT—A 16-page illustrated booklet has been published by the International Combustion Engineering Corp., New York, in which a brief description of the company's products is given. These include stokers, pulverized fuel systems, fuel oil burners, coal dryers, ash conveyors, oil torches, etc.

WELDING AND CUTTING APPARATUS—The Alexander Milburn Co., Baltimore, has published a small 24-page illustrated booklet in which welding and cutting apparatus is described and illustrated. This apparatus includes acetylene generators, portable oxy-acetylene plants, torches, regulators, and other accessories.

STEAM TURBINES—The DeLaval Steam Turbine Co., Trenton, N. J., has published a 24-page illustrated booklet in which the plant and products of the company are described and illustrated. The products of the company include steam turbines, turbo alternators, centrifugal pumps, centrifugal blowers and compressors, and double helical gears.

ELECTRIC CRANES—Whiting Corp., Harvey, Ill., has published a 32-page illustrated booklet containing information on the operation and maintenance of electric cranes. The importance of keeping crane equipment in good repair, etc., is pointed out and how this should be done is outlined in detail. Numerous illustrations and line drawings of the various crane parts supplement the text.

MOTORS—Indestructible rotor, built-in overload capacity, effective system of ventilation, liberal shafts and bearings, and high starting and pull-out torques are claimed for the motors manufactured by the Louis Allis Co., Milwaukee, in a 16-page illustrated booklet which recently was published. The heavy-duty type of motor is described in the booklet, the various parts of it being described and illustrated in detail.

DRYERS—Ruggles-Coles Engineering Co., New York, has published a 4-page illustrated folder in which several classes of material dryers are described and illustrated. One type is adapted to drying coal, coke, ores, concentrates, rock, stone, sand, etc. Another type is adapted to china clays, whiting, talc rock, kaolin, while still another is adapted to drying grain, cotton seed, starch feed, tobacco stems, etc. Operation of the various types is described.

POWER LOSSES—The Uehling Instrument Co., Paterson, N. J., has issued a 12-page folder which deals with two great losses in the steam power plant, namely the loss in steam turbine economy due to air leakage into the condensing system, and the sensible heat in the flue gases lost up the chimney. A table gives data on steam turbine economy as related to the absolute back pressure. A combined barometer and vacuum recorder, described and illustrated in the folder, acts as an automatic log of condenser performance, recording the existing vacuum as well as the absolute back pressure for every second of the day. The chart is legible to less than 1/50-inch of mercury between the range of 0 and 6 pounds back pressure, thus detecting air leakage into the condenser, exhaust piping or turbine casing, and showing whether or not the condenser is large enough to handle the load under any given conditions. In another table data on combustion are given. In addition recording and indicating instruments are described and illustrated, and 12 important uses to which they are adapted are pointed out.

BUDD STAMPINGS

We have specialized a big percentage of cost out of SMALL STEEL STAMPINGS. If you use small blanks, stampings or pressed parts, this fact should be of interest and importance —whether you buy or produce them yourself. To you an opportunity to lower cost is vital. To us it is important to convince you that we have accomplished

Something Definite—

in cost reduction, the minimum of die expense, the entire elimination of scrap loss, the most economical handling of your needs. Let us then "lay our cards upon the table" and tell you the definite reasons why BUDD STAMPINGS are worth your careful consideration. You can get quick action by writing for more detailed information, or, better, by sending drawings or samples for our estimate.

Any inquiries you may send us will be appreciated and will be given prompt and energetic attention.

Address

SPECIALTY DEPARTMENT

EDW. G. BUDD MFG. CO.

Makers of All Steel Automobile Bodies

PHILADELPHIA, PA.

West of the Mississippi

BLACK ROCK, ARK.—Coffey & Sons plan a 1-story plant addition, 50 x 150 feet.

EL DORADO, ARK.—The plant of the North American Oil Co. recently was damaged by fire.

HUNTINGTON PARK, CAL.—The Hercules Foundries, Inc., is building a steel warehouse, 40 x 175 feet.

LONG BEACH, Cal.—The Long Beach Iron Works plans a plant to cost $75,000.

LOS ANGELES—The California Enameling Co., manufacturer of enameled metal products, plans a 1-story plant, 300 x 600 feet.

LOS ANGELES—The Alloy Steel & Metal Co. has awarded a contract for a factory building.

LOS ANGELES—The Pacific Wire Rope Co., 1840 East Fifteenth street, manufacturer of galvanized wire, has awarded a contract for a 1-story plant addition, 67 x 125 feet.

OAKLAND, CAL.—The Fisher Body Co. is erecting a factory building here.

OAKLAND, CAL.—The Metal Products Co. of America has been incorporated with $1,000,000 capital stock to manufacture and deal in metal products, etc., by G. P. Regan, E. G. Fischer, E. A. Dixon, 410 Oakland avenue, L. J. Meltzer and F. A. McHugh.

OAKLAND, CAL.—The Shere Metal Products Corp. has been incorporated with $200,000 capital stock by L. G. Rowell, Claude E. White, 5483 College street, John E. Schmidt, and others.

SACRAMENTO, CAL.—The Latourette-Fical Co., 917 Third street, manufacturer of sheet metal products, has awarded a contract for a 2-story plant building to cost about $25,000.

ST. LOUIS—The Wissler Instrument Co. has acquired a 4-story building, 65 x 100 feet, at Fifteenth and Pine streets, which it will remodel.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.95
Mesabi Bessemer, 55 per cent iron	5.70
Old Range nonbessemer, 51½ per cent iron	5.20
Mesabi nonbessemer, 51½ per cent iron	5.05

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	9.50 to 10.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports.

Spanish low phosphorus, 52 to 54 per cent	9.00 to 10.00
Algerian low phosphorus, 52 to 54 per cent	10.00 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent	11.00 to 11.50
Swedish foundry or basic, 68 per cent	9.00 to 9.50
Spanish foundry or basic, 52 to 54 per cent	8.00 to 9.00

Manganese Ore

Brazilian, minimum 47 per cent c.i.f. Atlantic ports, nominal.

Indian, 48 to 50 per cent, 31¼ cents c.i.f. Atlantic ports.

Caucasian, 53 to 55 per cent, nominal.

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per ton	$21.50

Rivets

Structural rivets, Pittsburgh	3.00c
Boiler rivets, Pittsburgh	3.10c
Rivets, ⅞-inch and smaller	65 and 5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1½ inches inclusive)

Hot pressed square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched semifinished hexagon nuts ¾-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts ⅞-inch and smaller	70-10-5 off
Case hardened, finished, hexagon	65-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
¾ x 6 inches, smaller and shorter

Rolled thread	50-10-5 off
Cut thread	50 off
Larger and longer	50 off

MACHINE BOLTS
(¾ x 4 inches, hot pressed nuts)

Rolled thread	60-5 off
Cut thread	50-10 off
Larger and longer	50-10 off
(¾ x 4 inches, cold punched nuts)	
Cut thread	45 off
Larger and longer	45 off
Lag screws	50-10 off
Plow bolts Nos. 1, 2 and 3 heads	50-5 off
Tap bolts	30 off
Bolt ends with hot pressed nuts	50-10 off
Bolt ends with cold punched nuts	45 off
Blank bolts	50-10 off
Rough stud bolts with nuts	45 off

WASHERS

Wrought washers	$5.75 off list

Steel Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
Butt Weld		
⅛-inch	49 to 47	23½ to 22½
¼ and ⅜-inch	55 to 53	29½ to 28½
½-inch	60 to 58	46½ to 45½
¾-inch	64 to 62	52½ to 51½
1 to 3-inch	66 to 64	54½ to 53½
Lap Weld		
2-inch	59 to 57	47½ to 45½
2½ to 6-inch	63 to 61	51½ to 50½
7 to 8-inch	60 to 58	47½ to 46½
9 to 12-inch	59 to 57	46½ to 45½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	64 to 62	52½ to 51½
Lap Weld		
2-inch	57 to 55	45½ to 44½
2½ to 6-inch	61 to 59	49½ to 48½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	45 to 43	28½ to 27½
¼ and ⅜-inch	51 to 49	34½ to 33½
½-inch	57 to 55	46½ to 45½
¾-inch	62 to 60	51½ to 50½
1 to 1½-inch	64 to 62	53½ to 52½
2 to 3-inch	65 to 63	54½ to 53½
Lap Weld		
2-inch	57 to 55	46½ to 45½
2½ to 4-inch	61 to 59	50¼ to 45½
4½ to 6-inch	60 to 58	49½ to 48½
7 to 8-inch	56 to 54	43½ to 42½
9 to 12-inch	50 to 48	37½ to 36½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	46 to 44	36½ to 35½
¾ to 1½-inch	49 to 47	39½ to 38½
2 to 2½-inch	51 to 49	41½ to 40½
Lap Weld		
2-inch	45 to 43	36½ to 35½
2½ to 4-inch	47 to 45	38½ to 37½
4½ to 6-inch	46 to 45	37½ to 6½
7 to 8-inch	42 to 40	29½ to 28½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+7	+33
½-inch	26	8
¾-inch	32	17
1 to 1½-inch	34	19
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	29	15
2½ to 6-inch	32	19
7 to 12-inch	30	17
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+15	+48
½-inch	25	13
¾-inch	32	18
1 to 1½-inch	34	20
Lap Weld		
2-inch	30	17
2½ to 4-inch	33	21
4½ to 6-inch	32	20
7 to 8-inch	25	13
9 to 12-inch	20	8

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+37½	+49½
¾-inch	+18	+30
1-inch	+34	+46
1¼-inch	+18	+30
1½-inch	+17	+29
Lap Weld		
2 and 2½-inch	+ 3	+15
3 to 4-inch	2	+ 7
4½ to 6-inch	1	+ 7
8-inch	+ 4	+ 8

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL	
1¼-inch	17½ to 9½ off
2 and 2¼-inch	32 to 24 off
2½ to 3-inch	43 to 35 off
3¼ to 4-inch	48 to 40 off
CHARCOAL IRON	
1½-inch	+16
1¾-inch	+ 6
2 and 2¼-inch	4
2½ to 3-inch	9
3¼ to 4½-inch	11
SEAMLESS COLD DRAWN	
1-inch	51
1¼ and 1½-inch	43
1¾-inch	27
2 and 2¼-inch	30
2½ and 2¾-inch	34
3-inch	38
3¼ to 4-inch	43
4½ and 5-inch	35
SEAMLESS HOT ROLLED	
3-inch	40
3½ to 4-inch	45

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent	85 off
Carbon, 0.30 to 0.40 per cent	83 off
Carbon, 0.40 to 0.50 per cent	82 off

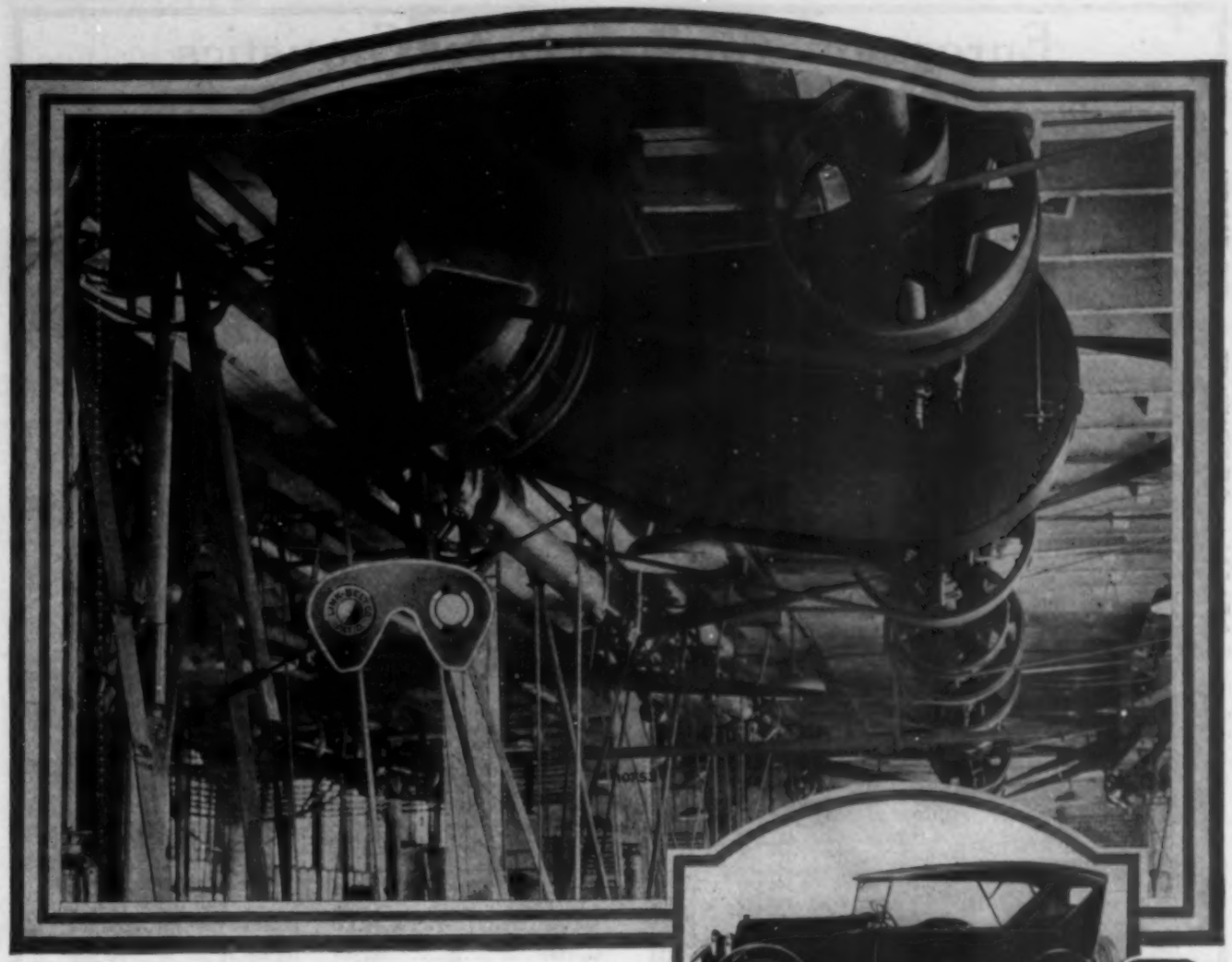
Plus usual differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot, f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	19c
3-inch	7-gage	34c
1½-inch	9-gage	13¼c
5½-inch	9-gage	53c
5½-inch	9-gage	55c

Plus usual extras for forming and for long lengths.



TRANSMITTING POWER AT THE "CADILLAC" PLANT

THE Cadillac Motor Car Co.'s production methods have always been recognized as highly efficient.

All of the shafting at this plant is driven by Link-Belt Silent Chain, over 53 drives being in use. Power Transmission efficiency is guaranteed with these drives. They transmit practically the full power of the motor, without slip — smoothly and uniformly. The result is a uniformly perfect product, maximum output from the machines, and economy of power.

Your product may be entirely different from that of automobile factories, but your power transmission problems may be much the same. Let our experienced engineers show you how to get maximum results.

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PHILADELPHIA LINK-BELT COMPANY CHICAGO TORONTO INDIANAPOLIS

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St. Louis - Central Nat'l Bank Bldg.
Buffalo - - 547 Ellicott Square
Wilkes-Barre - - 24 Nat'l Bank Bldg.
Huntington, W. Va. Robson-Pritchard Bldg.
Cleveland - - 439 Kirby Bldg.
Detroit - - 4210 Woodward Ave.
Kansas City, Mo. - - 306 Elmhurst Bldg.
Seattle - - 820 First Avenue, S.
Portland, Ore. - - - 101 First St.
San Francisco - - 160 Second Street
Los Angeles - 163 N. Los Angeles St.
Denver Lindroth, Shubart & Co., Boston Bldg.
Atlanta, Ga., 610-11 Citizens and Southern Bank Bldg.
Louisville, Ky. - Frederick Wehle, Starks Bldg.
New Orleans - C. O. Hinz, 504 Carondelet Bldg.
Birmingham, Ala., S. L. Morrow, 720 Brown-Marx Bldg.
Charlotte, N. C. J. S. Cothran, Com'l Bank Bldg.

Canadian Link-Belt Co., Ltd., Toronto and Montreal
H. W. CALDWELL & SON CO., CHICAGO
NEW YORK, Woolworth Bldg.
DALLAS, TEXAS, 709 Main St.

LINK-BELT
SILENT CHAIN DRIVES

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	729,000	405,000	192,000	184,800
Monthly average 1913..	855,000	427,000	203,800	209,000
Monthly average 1919..	617,000	198,000	20,600	50,000
Monthly average 1920..	667,300	287,700	92,700	58,000
Monthly average 1921..	217,600	280,300	71,800	79,600
1921				
January	642,100	288,000	110,600	93,500
February	463,600	287,400	103,700	81,700
March	386,000	295,300	104,700	27,600
April	60,300	287,700	94,700	70,800
May	13,600	278,100	74,600	78,700
June	800	280,900	67,400	81,700
July	10,200	202,400	44,600	70,000
August	94,200	250,800	43,800	72,800
September	158,300	239,800	59,800	86,200
October	235,500	251,800	45,800	98,800
November	271,800	290,000	59,800	92,400
December	275,000	296,300	73,000	100,800
Total for 1921.....	2,611,400	3,308,500	862,500	955,000
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	116,500	130,900
April	394,300	377,300	112,000	128,800
May	407,900	435,300	117,100	139,300
June	369,200	409,300	113,100	141,500
July	399,100	421,400	125,200	147,800
August	411,700	440,400	151,500	147,800
September	430,300	454,600	160,600	149,400
October	481,500	495,600	172,000	162,600
November	493,900	.....	.....	151,300

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxemburg
Monthly average 1912..	566,000	363,000	206,000	79,400
Monthly average 1913..	639,000	385,000	202,300	109,000
Monthly average 1919..	658,000	179,000	27,400	32,000
Monthly average 1920..	754,700	250,200	101,300	49,000
Monthly average 1921..	302,100	254,500	65,000	62,300
1921				
January	493,400	263,700	119,100	70,800
February	483,500	259,600	98,400	62,000
March	359,100	246,900	96,300	19,700
April	70,600	252,600	108,700	57,100
May	5,700	240,400	62,800	56,100
June	2,700	240,800	54,200	61,000
July	117,200	219,500	26,900	57,100
August	434,100	228,600	27,800	55,100
September	429,300	232,100	34,000	76,200
October	405,400	255,900	41,900	81,800
November	443,800	272,700	46,200	69,900
December	381,000	297,600	63,200	80,700
Total for 1921.....	3,625,800	3,010,400	779,500	747,500
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	361,200	104,000	99,200
April	404,200	319,300	95,200	98,100
May	462,300	358,100	116,500	112,200
June	400,200	352,500	111,300	121,600
July	473,100	362,900	112,500	125,600
August	528,400	390,300	149,100	129,200
September	555,900	400,300	154,900	132,600
October	565,200	423,000	179,600	136,800
November	600,800	.....	.....	130,200

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	166,400	16,400	87,000	27,300
Average monthly 1913..	185,900	12,900	68,900	25,000
Average monthly 1919..	42,400	113,100	44,400	.....
Average monthly 1920..	92,400	89,000	67,000	26,200
Average monthly 1921..	137,100	38,500	43,300	.....
1921				
January	157,800	44,200		
February	153,400	35,400	120,100	125,000*
March	156,100	33,900		
April	102,100	26,100		
May	81,900	31,700	93,500	36,000
June	84,500	20,700		42,100
July	103,600	30,300		45,100
August	141,500	16,100	130,600	61,200
September	206,100	27,900		79,800
October	172,800	19,800		96,600
November	169,200	20,700	168,000	54,300
December	117,000	128,000		56,300
Total for 1921.....	1,646,000	434,800	514,200	596,400*
1922				
January	88,700	36,600		68,200
February	64,600	55,800	139,000	66,900
March	63,800	67,300		105,700
April	59,900	89,100	32,400	129,000
May	60,900	41,100	62,400	154,300
June	52,800	73,200		137,700
July	55,900	54,800		182,900
August	80,100	40,300	129,700	181,800
September	70,600	50,000		175,000
October	90,600	109,200	.....	233,800
November	79,800	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	400,600	41,500	124,500	482,400
Average monthly 1913..	414,100	48,200	128,800	516,900
Average monthly 1919..	186,100	19,400	74,500	.....
Average monthly 1920..	270,900	74,600	74,300	143,600
Average monthly 1921..	141,700	132,700	75,900	176,000
1921				
January	232,400	89,300		
February	166,900	125,800	294,000	503,600*
March	148,900	122,700		
April	160,100	117,400		.....
May	99,000	96,900	241,300	127,800
June	64,700	109,100		159,700
July	64,000	87,600		175,000
August	76,500	122,500	192,300	236,300
September	133,300	171,200		221,800
October	155,800	188,300		242,300
November	193,500	167,400	176,000	230,600
December	205,300	131,700		212,900
Total for 1921.....	1,700,400	1,529,900	903,600	2,110,000*
1922				
January	235,300	164,000		218,200
February	223,400	107,000	198,400	170,000
March	295,800	72,300		208,700
April	258,400	125,800	83,900	195,500
May	272,400	122,200	279,600	204,500
June	236,300	180,300		209,132
July	251,700	182,100		206,200
August	270,000	168,400	522,600	181,300
September	279,200	174,000		223,500
October	347,100	235,600	.....	229,900
November	372,300	.....	.....	.....

Note—Belgian figures include Luxemburg since June 1, 1922.

*Provisional estimate. Export and import figures do not include scrap.

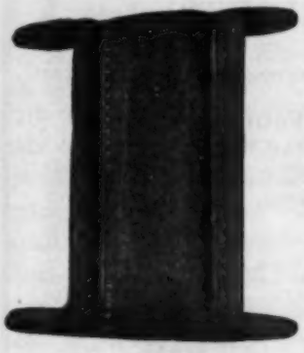
American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1922		
August	32,010	144,264
July	44,384	156,392
June	24,101	216,298
May	17,292	229,616
April	15,884	197,562
March	8,612	206,474
February	10,216	133,333
January	10,511	155,822
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	15,784	516,447
Total	117,105	2,156,818

1920		
December	15,120	499,780
November	50,995	434,290
October	39,797	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,125	419,064
April	29,681	395,583
March	38,377	426,448
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
December	39,806	254,780
November	43,826	336,994
October	40,698	302,459
September	43,567	363,531
August	28,987	396,743
July	28,258	287,685
June	21,056	561,020
May	17,885	422,282
April	16,560	396,813
March	17,632	367,224
February	12,302	344,180
January	16,913	371,570
Total	327,490	4,405,281
1918	168,225	5,372,424
1917	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	362,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687

WHY
PARISH & BINGHAM
PRESSED STEEL PARTS?



Motor Support
Formerly a Casting

The reasons are many:

They are stronger than castings;
They are tougher than castings;
They are less brittle than castings;
They are lighter than castings;
They are absolutely uniform in shape;
They are absolutely uniform in weight;
They are produced rapidly;
They are produced at low cost;
They are completely finished when you get them—no machining necessary.

Parish and Bingham Engineers are specialists in designing suitable substitutions for castings and in producing heavy gauge pressed products.

Gasoline Tank Support
Formerly made from
Malleable Casting or
Drop Forging

A Few of the Hundreds of Parts We can make for You—

Brake Drums; Axle Housings; Running Boards; Engine Pans; Hub Flanges; Axle Housing Covers; Torque Arms; Battery Supports; Lathe Pans; Tire Carriers; Running Board and Step Hangers; Pressed Steel Commercial Car Wheels; Light Railroad Stampings; Agricultural Implement Parts, etc.

Parish & Bingham Corporation

Builders of Automobile Frames and Steel Stampings

CLEVELAND, OHIO

P&B

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$15.00 to 16.00
Boston (dealers)	15.50 to 16.00
Chicago	19.25 to 19.75
Buffalo	21.00 to 21.75
Cincinnati	17.00 to 17.50
Cleveland	20.25 to 20.50
Detroit (dealers)	17.00 to 17.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	14.50 to 15.00
Pittsburgh	22.00 to 22.50
San Francisco	12.50 to 13.00
St. Louis	18.00 to 18.50
Valleys	22.00 to 22.50
No. 1 railroad steel New York (dealers)	16.25 to 16.75

BUNDLED SHEETS

Buffalo	$15.00 to 15.75
Cleveland	14.00 to 15.00
Cincinnati	13.00 to 13.50
Detroit	15.50 to 16.00
Eastern Pennsylvania	16.50 to 17.00
Pittsburgh	19.00 to 19.50
St. Louis	12.25 to 12.75
Valleys	17.50 to 18.50

STEEL RAILS, SHORT

Birmingham	$20.00 to 22.00
Boston (dealers)	15.50 to 16.00
Chicago	22.00 to 22.50
Cincinnati	20.00 to 20.50
Cleveland	19.00 to 20.00
St. Louis	21.50 to 22.00

STOVE PLATE

Birmingham	$17.00 to 18.00
Boston (consumers)	16.00 to 17.00
Buffalo	19.00 to 19.75
Chicago	19.50 to 20.00
Cincinnati (net)	13.00 to 14.00
Cleveland	18.00 to 18.50
Detroit (net ton) (dealers)	14.00 to 14.50
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	13.50 to 14.00
Pittsburgh	16.50 to 17.00
St. Louis	19.50 to 20.00

LOW PHOSPHORUS

Buffalo	$23.00 to 23.75
Cincinnati	18.50 to 19.00
Eastern Pennsylvania	23.00 to 24.00
Pitts. billet and bloom crops	25.50 to 26.00

SHOVELING STEEL

Chicago	$18.75 to 19.25
Pittsburgh	18.50 to 19.00
St. Louis	17.50 to 18.00

KNUCKLES, COUPLERS & SPRINGS

Chicago	$24.50 to 25.00
Eastern Pennsylvania	22.00 to 23.00
Pittsburgh	24.00 to 25.00
St. Louis	24.00 to 24.50

COMPRESSED SHEETS

Buffalo	$19.50 to 20.25
Chicago	16.50 to 17.00
Pittsburgh	20.50 to 21.00
Cleveland	18.50 to 19.00
Detroit (dealers)	15.00 to 15.50
Valleys	20.50 to 20.75

FROGS, SWITCHES, GUARDS

Chicago	$19.25 to 19.75
Eastern Pennsylvania	20.00 to 21.00
St. Louis	19.00 to 19.50

BOILER PLATE, CUT

St. Louis (dealers)	$14.00 to 14.50

ANGLE BARS—STEEL

Chicago	$21.00 to 21.50
St. Louis	19.00 to 19.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$19.00 to 20.00
Boston (dealers)	15.00 to 15.50
Buffalo	19.00 to 19.50
Chicago, No. 1	20.00 to 20.50
Chicago, No. 2	19.25 to 19.75
Cincinnati, No. 1	14.50 to 15.50
Cleveland, No. 1	12.00 to 12.25
Eastern Pennsylvania, No. 1	23.00 to 23.50
Pittsburgh, No. 1	20.50 to 21.00
Pittsburgh, No. 2	22.00 to 22.50
New York, No. 1 (dealers)	16.50 to 17.00
St. Louis, No. 1	19.00 to 19.50
St. Louis, No. 2	18.50 to 19.00

WROUGHT PIPE

Boston (dealers)	$11.50 to 12.00
Buffalo	16.00 to 16.75
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.75 to 13.25

YARD WROUGHT

Boston	$13.50 to 14.00
Eastern Pennsylvania, No. 1	18.00 to 19.00

CITY WROUGHT

New York, long	$13.00 to 13.50

BUSHELING

Buffalo, No. 1	$19.50 to 20.25
Chicago, No. 1	18.00 to 18.50
Chicago, No. 2	11.25 to 11.75
Cincinnati, No. 1	15.00 to 15.50
Cleveland, No. 1	17.00 to 17.25
Cleveland, No. 2	14.00 to 15.00
Detroit, No. 1	13.00 to 13.50
Detroit, No. 2 (new)	11.50 to 12.00
Detroit, No. 2 (old)	10.50 to 11.00
Eastern Pennsylvania, No. 1	16.00 to 16.50
Pittsburgh, No. 1	18.00 to 18.50
St. Louis, No. 1	17.00 to 17.50

MACHINE SHOP TURNINGS

Birmingham	$10.00 to 11.00
Boston (dealers)	12.00 to 12.50
Buffalo	15.25 to 16.00
Chicago	13.00 to 13.50
Cleveland	16.25 to 16.50
Cincinnati (net)	11.50 to 12.00
Detroit (dealers)	12.50 to 13.00
Eastern Pennsylvania	16.50 to 17.00
New York (dealers)	13.25 to 13.75
Pittsburgh	16.75 to 17.25
St. Louis	11.00 to 11.50
Valleys	16.00 to 17.00

CAST IRON BORINGS

Birmingham (chemical)	$15.50 to 16.00
Birmingham, borings (plain)	10.00 to 11.00
Boston (chemical)	17.00 to 18.00
Boston (dealers)	16.50 to 17.00
Buffalo	17.50 to 18.00
Chicago	15.50 to 16.00
Cincinnati (net)	12.00 to 12.50
Cleveland	17.50 to 18.00
Detroit (dealers)	13.50 to 14.00
Eastern Pennsylvania	16.50 to 17.00
Eastern Pennsylvania (chemical)	22.50 to 23.00
Pittsburgh	18.50 to 19.00
New York (dealers' price)	13.25 to 13.75
St. Louis	13.00 to 13.50
Valleys	17.75 to 18.00

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	$12.00 to 12.50
Cleveland	17.00 to 17.25
Detroit (dealers)	14.00 to 14.50
Eastern Pennsylvania	15.50 to 17.00
New York (dealers)	13.25 to 13.75

IRON AXLES

Birmingham	$23.00 to 25.00
Boston	27.00 to 28.00
Buffalo	24.00 to 25.00
Chicago	29.00 to 29.50
Cincinnati	24.00 to 25.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	25.00 to 26.00
Pittsburgh	32.50 to 33.00
St. Louis	30.25 to 30.75

IRON RAILS

Buffalo	$19.75 to 20.25
Chicago	23.50 to 24.00
Cincinnati	16.00 to 17.00
Cleveland	18.00 to 18.50
St. Louis	21.00 to 21.50

PIPES AND FLUES

Chicago	$14.00 to 14.50
Cincinnati	12.00 to 12.50
Cleveland	14.00 to 14.50
St. Louis	13.00 to 13.50

RAILROAD GRATE BARS

Buffalo	$18.25 to 19.00
Chicago	20.50 to 21.00
Cleveland	18.00 to 18.50
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	13.50 to 14.00
St. Louis	19.00 to 19.50

FORGE FLASHINGS

Boston (dealers)	$11.50 to 12.00
Chicago, small	14.50 to 15.00
Cleveland	13.50 to 14.00
Cleveland, large	14.00 to 15.00
Detroit (dealers)	13.50 to 14.00

FORGE SCRAP

Boston	$11.00 to 11.50
Chicago	19.00 to 19.50
Eastern Pennsylvania, No. 1	17.00 to 18.00

ARCH BARS AND TRANSOMS

Chicago	$26.00 to 26.50
St. Louis	25.00 to 25.50

ANGLE BARS—IRON

Chicago	$26.00 to 26.50
St. Louis	25.00 to 25.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$14.00 to 14.50
Buffalo	18.75 to 19.25
Chicago	17.00 to 17.50
Cleveland	17.00 to 17.25
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	19.50 to 20.00
St. Louis	15.00 to 15.50

STEEL CAR AXLES

Birmingham	$22.00 to 24.00
Boston (dealers)	23.00 to 24.00
Buffalo	23.00 to 24.00
Chicago	21.50 to 22.00
Cleveland	22.00 to 22.50
Eastern Pennsylvania	24.00 to 25.00
New York (dealers)	17.00 to 18.00
Pittsburgh	22.50 to 23.00
St. Louis	24.00 to 24.50

SHAFTING

Boston (dealers)	$23.00 to 24.00
Chicago	23.50 to 24.00
Eastern Pennsylvania	23.00 to 24.00
New York (dealers)	16.00 to 16.50
St. Louis	21.50 to 22.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	$17.50 to 18.50
Birmingham, tram car	19.00 to 20.00
Boston (consumers)	20.00 to 21.00
Buffalo, iron	22.00 to 22.75
Chicago, iron	25.50 to 26.00
Cincinnati	19.50 to 20.00
Eastern Pennsylvania, cupola	23.00 to 24.00
New York, iron (dealers)	17.50 to 18.00
Pittsburgh, iron	23.50 to 24.00
Pittsburgh, steel	24.00 to 25.00
St. Louis, iron	25.00 to 25.50

NO. 1 CAST SCRAP

Birmingham, cupola	$21.00 to 22.00
Boston (consumers)	21.00 to 22.00
Buffalo	21.75 to 22.25
Chicago, cupola	24.50 to 25.00
Cincinnati, No. 1, machinery, cupola (net)	22.00 to 22.50
Cleveland, cupola	21.00 to 22.00
Detroit (net ton) (dealers)	17.00 to 17.50
Eastern Pennsylvania, cupola	21.00 to 22.00
New York, cupola (dealers)	18.00 to 18.50
Pittsburgh, cupola	23.00 to 23.50
San Francisco	25.00 to 26.00
St. Louis, agricultural	21.50 to 22.00
St. Louis, railroad	21.50 to 22.00
Valleys	22.00 to 22.50

HEAVY CAST

Boston (consumers	$18.50 to 19.50
Buffalo	19.00 to 19.75
Cleveland	16.50 to 17.00
Detroit, automobile (net ton)	19.00 to 19.50
Eastern Pennsylvania	20.00 to 25.00
New York (dealers)	16.50 to 17.00
Pittsburgh	20.00 to 20.50

MALLEABLE

Boston (railroad)	$20.50 to 21.00
Buffalo	22.75 to 23.25
Chicago, railroad	25.00 to 25.50
Chicago, agricultural	25.00 to 25.50
Cincinnati, agricultural	18.00 to 18.50
Cincinnati, railroad	18.50 to 19.00
Cleveland, agricultural	20.00 to 21.00
Cleveland, railroad, nominal	21.50 to 22.00
Detroit (dealers)	18.50 to 19.00
Eastern Pennsylvania, railroad	19.00 to 20.00
Pittsburgh, railroad	21.50 to 22.00
Pittsburgh, agricultural	17.50 to 18.00
St. Louis, agricultural	22.00 to 22.50
St. Louis, railroad	22.00 to 22.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	$18.00 to 19.00
Boston (dealers)	15.00 to 15.50
Chicago	20.50 to 21.00
Cleveland	22.00 to 22.50
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	16.00 to 16.50
Pittsburgh district	22.00 to 22.50
St. Louis	20.50 to 21.00

LOCOMOTIVE TIRES

Chicago	$20.50 to 21.00
St. Louis	19.00 to 19.50

LOW PHOSPHORUS PUNCHINGS

Chicago	$21.50 to 22.00
Eastern Pennsylvania	22.00 to 24.00
Pittsburgh	24.00 to 24.50